Belknap Road
Traffic Calming Needs Assessment

August 10, 2016

GPI Greenman-Pedersen, Inc.
Engineering and Construction Services

Choose FRAMINGHAM

REF: MAX-2015047.05

DATE: August 4, 2016

TO: Mr. Eric V. Johnson, P.E.
Town Engineer
Framingham Department of Public Works
110 Western Avenue
Framingham, MA 01702

FROM: Mr. John W. Diaz, P.E., P.T.O.E.
Ms. Rebecca Brown, P.E., P.T.O.E.

RE: Traffic Calming Needs Assessment
Belknap Road – Framingham, Massachusetts

INTRODUCTION

Greenman-Pedersen, Inc. (GPI), on behalf of the Town of Framingham, has conducted a Traffic Calming Needs Assessment along Belknap Road between Edgell Road and Pleasant Street (Route 30). This assessment provides a summary of existing traffic conditions along the roadway and quantifies the need for the implementation of traffic calming measures.

By definition, traffic calming involves the combination of mostly physical measures that reduces the negative effects of motor vehicle use, alters driver behavior, and improves conditions for non-motorized users. Traffic calming when applied in an appropriate and justified manner has proven to be an effective means to reduce vehicle speeds, volumes and improve safety for all roadway users.

The adoption of traffic calming can only occur as a result of a structured process. As such the Town of Framingham has developed a Policy on Traffic Calming Measures *designed to enable community support for traffic education, facilitate the identification of specific traffic concerns,*

collect data, develop solutions, and evaluate the impact of these solutions. This policy defines the process by which traffic calming measures may be considered for installation within the Town. It is the responsibility of the Town's Traffic and Roadway Safety Committee (TRSC) to administer the policy. The process of responding to, investigating and addressing resident's requests for traffic calming measures along Belknap Road will follow this policy to the maximum extent possible.

The traffic calming process is heavily dependent upon the input of the residents within the neighborhood(s) in the subject area. If the implementation of traffic calming measures is recommended by the TRSC through this process, a preferred traffic calming plan will then be developed through close coordination between the TRSC, the residents and the engineers. As such, it is critical that the public play an active role in the traffic calming process.

The details of the traffic calming process as they pertain to Belknap Road will be discussed at the upcoming meeting of the Traffic and Roadway Safety Committee (TRSC).

The subsequent portions of this memorandum summarize GPI's initial findings as part of the Traffic Calming Needs Assessment.

SUMMARY

Residents of Belknap Road have requested that the Town consider implementing traffic calming measures along Belknap Road to address safety concerns. Excessive vehicles speeds, lack of pedestrian and bicycle amenities, lack of visibility, and distracted drivers are noted as the prevailing concerns. The resident's petition and request letter are provided in the Appendix A.

In response to these concerns, and in accordance with the Town's Policy on Traffic Calming Measures, the Town commenced with the collection of preliminary traffic data along Belknap Road during the month of January 2016. Based on the review of this effort, the TRSC has determined that the traffic calming request merits further consideration and has authorized the completion of a Traffic Calming Needs Assessment[1] for the entire length of Belknap Road between Pleasant Street (Route 30) and Edgell Road.

If the Traffic Calming Needs Assessment deems that the implementation of further traffic calming measures is justified, and is supported by the TRSC, a traffic calming project may be initiated. A traffic calming project includes the development of a preferred traffic calming plan

[1] A Traffic Calming Needs Assessment is a report based on various data (traffic volumes, vehicle speeds, accidents, roadway features, etc.) used to establish baseline conditions in a clearly defined study area to determine whether traffic or safety concerns exist that warrant implementation of a traffic calming plan.

in coordination with all stakeholders. It is the intent of the Town's traffic calming policy to place recommended finalized traffic calming projects on the Town of Framingham's Priority List of Traffic Calming Projects. Projects on this list will be ranked by need based on a defined ranking system. Each year the TRSC will submit a funding request to the Board of Selectmen for the design and construction of projects on this priority list ranked in order by need. Funding for these projects will then be subject to final approval at annual Town Meeting as a capital budget item.

The Town has retained GPI to conduct this Traffic Calming Needs Assessment for Belknap Road. ***Based on our investigation, the implementation of speed control traffic calming measures is justified to address resident speeding and pedestrian safety concerns. However, implementation of most measures is limited as Belknap Road is classified by the Massachusetts Department of Transportation (MassDOT) as an Urban Minor Arterial.***

The traffic data documented herein clearly indicates vehicles are traveling in excess of the posted speed limits on Belknap Road. It is important to note however that the design of any speed control traffic calming measures, such as those suggested as part of the conceptual traffic calming plan presented in this needs assessment, will require additional engineering study to determine the exact location of these devices due to the geometric limitation of the existing roadway. *If a traffic calming project is recommended by the TRSC for Belknap Road, the project should include a supplemental detailed design phase to ensure all engineering concerns are adequately addressed.*

Belknap Road is functionally classified as an Urban Minor Arterial, which is intended to provide some measure of regional mobility. For this reason the use of volume control traffic calming measures, as well as raised speed control devices, is **not** recommended.

Finally, while the lack of pedestrian and bicycle amenities is apparent, the ability to construct these amenities is limited by existing roadway width, right-of-way, roadside features and the roadway's Scenic Road designation. The design and construction of these amenities would require an in-depth design, permitting and construction process outside of the scope and purview of the traffic calming process. By reducing vehicle speeds, the implementation of speed control traffic calming measures does have the potential to increase driver attentiveness to pedestrians and bicyclists and reduce accident severity.

STUDY AREA

The study area consists of the entirety of Belknap Road between Edgell Road and Pleasant Street (Route 30), encompassing approximately 1.70 miles of roadway. The study area includes the unsignalized intersections with Flanagan Drive, Monterey Lane/Major Hale Drive, Woodmere Road, Millwood Street/Clearview Drive, Bellwood Road, Knight Road, Mill Street, and Grove Street, and is depicted in **Figure 1**. Belknap Road is under local jurisdiction.

Belknap Road is classified by the Massachusetts Department of Transportation (MassDOT) as an urban minor arterial and runs generally in an east-west direction between Pleasant Street (Route 30) to the west and Edgell Road to the east. The character of the study area segment is low-density in nature with single-family residential homes. The Brophy Elementary School is located nearby on Pleasant Street which generates walking trips along Belknap Road. The road is identified by its general lack of roadside shoulders, clear zones or pedestrian refuge areas. No sidewalks and curbing are provided. Utility poles are primarily located on the northern side of the roadway west of Major Hale Drive and on the southern side of the roadway east of Monterey Lane, directly abutting the travel way. Some roadway segments have notable grades, roadside features, and tight horizontal curves.

Most of Belknap Road is designated as a **Scenic Road** by the Town of Framingham under the Scenic Road Act[2] (the exception being from 300 feet west of Grove Street to 850 feet east of Grove Street). This designation prohibits the removal of trees or tearing down of stone walls abutting the roadway without prior Planning Board approval.

The study area along Belknap Road includes the following key locations, from west-to-east:

- The study area along Belknap Road begins at its western terminus at the intersection with **Pleasant Street (Route 30)**. At this intersection, the Belknap Road westbound approach is under stop control.

- **Flanagan Drive** intersects Belknap Road from the north and operates under stop control. A crosswalk on the west side of the intersection provides walking access to the Brophy Elementary School located at 575 Pleasant Street. Rapid rectangular flashing beacons have recently been installed at this crossing location. In addition, on each Belknap Road approach to Flanagan Drive, a school zone flasher with "Speed Limit 20 (mph) When Flashing" is provided.

2 Massachusetts General Laws. Ch. 40, s. 15C

- **Major Hale Drive and Monterey Lane** intersect Belknap Road to form a four way unsignalized intersection. Both Major Hale Drive and Monterey Lane are under stop control and intersect from the north and south, respectively. Each of these two side streets provide a sidewalk on the east side, although there is no marked crossing of Belknap Road.

- **Elsemiller Terrace** intersects Belkap Road from the south. Elsemiller Terrace is a dead-end residential street, and operates under an implied stop control.

- **Woodmere Road** intersects Belknap Road from the south and operates under stop control. A sidewalk is provided on the east side of Woodmere Road, although an ADA-compliant ramp is not provided at the beginning of the sidewalk off Belknap Road. A guardrail on the southeast corner of the intersection has evidence of being struck on at least one occasion.

- **Millwood Street and Clearview Drive** intersect Belknap Road to form a four-way unsignalized intersection. All four approaches to the intersection operate under stop control, although a supplemental placard is not provided to indicate the all-way stop. Stop lines are also provided on all four approaches. Sidewalks are provided on the west side of Clearview Drive and the east side of Millwood Street. Recent construction has provided for ADA-compliant wheelchair ramps and marked crossings of both Clearview Drive and the east side of Belknap Road to improve the north-south pedestrian circulation.

- **Bellwood Road** intersects Belknap Road from the south. It should be noted that neither a stop line or stop sign are located for this approach, however, the stop is implied for this approach.

- **Knight Road** intersects Belknap Road to form a four-way unsignalized intersection. Both Knight Road approaches operate under STOP control. Although a sidewalk is provided on the east side of Knight Road both north and south of Belknap Road, there is no marked crosswalk at the intersection.

- **Mill Street** intersects Belknap Road from the south and is under stop control with both a STOP sign and stop line present.

- **Grove Street** intersects Belknap Road from the north and south to form a four-way intersection, with all four approaches operating under STOP control with marked stop lines. Although both Belknap Road approaches to the intersection are on a horizontal curve, limiting the line of sight, advanced warning of the 4-way stop condition is <u>not</u> provided.

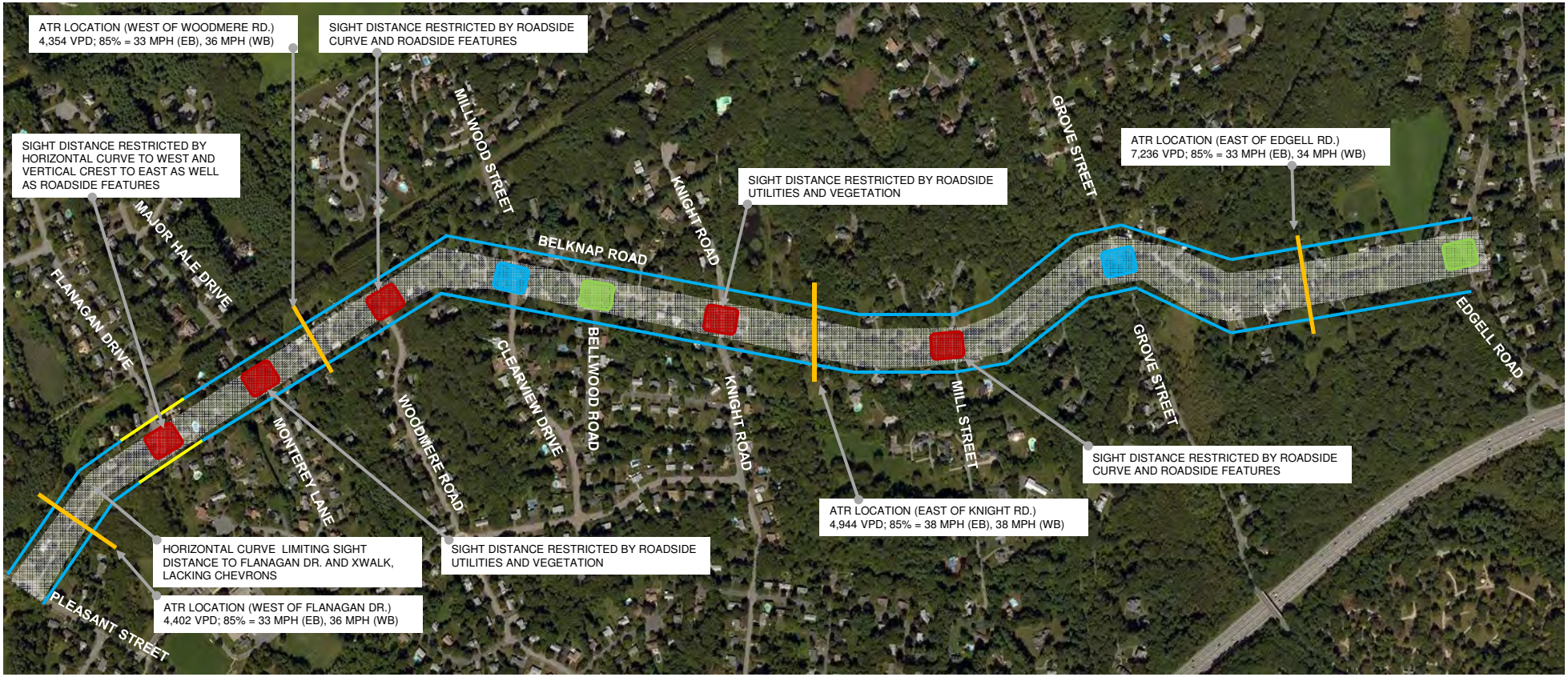
- The study area along Belknap Road terminates at its intersection with **Edgell Road**. Belknap Road intersects Edgell Road from the west to form an unsignalized T intersection. Belknap Road is under stop control, while Edgell Road operates under free flowing conditions. Again, no advance signing on Belknap Road is provided to warn of a stop condition to motorists traveling eastbound. Although there is a sidewalk present along the west side of Edgell Road, ADA-compliant wheelchair ramps and marked crosswalk are not present.

Safety concerns along Belknap Road are a result of the combination of vehicle speeds, narrow roadway widths, lack of sufficient roadside clear zones, significant horizontal and vertical curvature and the presence of a variety of roadside features (utility poles, trees, mailboxes, etc.). In addition, warning signs, such as curve ahead, stop ahead, etc. are virtually non-existent on Belknap Road, with the exception of the Millwood Street/Clearview Drive intersection noted above. There are multiple locations on Belknap Road that consist of straight alignments combined with narrow curving sections without adequate warning.

According to Town of Framingham Special Speed Regulation No. 5053 dated June 15, 1979, the speed limit is 25 miles per hour (mph) in both directions for the entire length of Belknap Road. There are several posted “25 MPH” speed limit signs within the study segment.

Belknap Road provides one travel lane in each direction separated by a double yellow centerline (DYCL). The roadway width ranges from 20 to 26 feet within the study area. No marked shoulders or sidewalks are provided.

Figure 1
Belknap Road- Existing Conditions



GPI Greenman-Pedersen, Inc.
Engineering and Construction Services

VOLUME AND SPEED DATA

To assess existing traffic conditions along Belknap Road, traffic volume and speed data was collected at various locations along the roadway. During the month of January 2016, the Framingham Police Department collected data in conjunction with a heightened traffic enforcement effort. Additional data was collected in March and May of 2016 as part of this Traffic Calming Needs Assessment. Table 1 below summarizes the data collected in March and May of 2016. All traffic data is provided in Appendix C.

As can be seen in **Table 1** the traffic volumes along Belknap Road ranged from 4,400 vehicles per day (vpd) west of Flanagan Drive to 4,350 vpd west of Woodmere Road, and from 4,940 vpd east of Knight Road to 7,240 vpd west of Edgell Road. Traffic is oriented towards the west in the morning and generally oriented towards the east in the evening. The weekday morning peak period occurs between 7:30 AM to 8:30 AM and the weekday evening peak period occurs between 5:00 PM to 6:00 PM. Peak hour traffic represents approximately 10.2% of the total daily traffic which is typical of arterial roadways. Trucks represent 2 to 5 percent of the total traffic volume.

Vehicle speeds are consistently higher than the posted speed limits throughout the day. At all four count locations, the average speed was 5 to 8 mph higher than the posted speed limit. The 85^{th} percentile speed, or operational speed, ranges from 8 to 13 mph higher than the posted speed limit. Speeds appeared the highest along Belknap Road between Clearview Drive and Grove Street, which is likely due to the relatively straight and flat nature of the roadway for approximately 0.4 miles. It should be noted that while there is a school zone speed limit in the vicinity of Flanagan Drive, vehicle speeds were not lower in this segment of the study area. Vehicle speeds are particularly concerning given the geometrics, restricted off-pavement clear zones of the roadway, and crossing at the Flanagan Drive intersection.

Table 1
BELKNAP ROAD – EXISTING TRAFFIC DATA SUMMARY

Location	Daily Volume (vpd) [a]	Morning Peak Hour Volume (vph) [b]	Morning Peak Hour K Factor (%) [c]	Morning Peak Hour Directional Distribution [d]	Evening Peak Hour Volume (vph)	Evening Peak Hour K Factor (%)	Evening Peak Hour Directional Distribution	Posted Speed Limit (mph) [e]	Average Speed (mph)	85th Percentile Speed (mph) [f]
Belknap Road, west of Flanagan Drive:										
Weekday Daily	4,402	483	10.9	63% WB	464	10.5	52% EB			
Eastbound	2,027	180			241			25 - EB	30 - EB	33 - EB
Westbound	2,375	303			223			25 - WB	32 - WB	36 - WB
Belknap Road, west of Woodmere Road:										
Weekday Daily	4,354	466	10.7	55% WB	475	10.9	51% WB			
Eastbound	2,346	257			244			25 - EB	30 - EB	33 - EB
Westbound	2,008	209			231			25 - WB	32 - WB	36 - WB
Belknap Road, east of Knight Road:										
Weekday Daily	4,944	510	10.3	65% WB	491	9.93	65% EB			
Eastbound	2,321	333			196			25 - EB	33 - EB	38 - EB
Westbound	2,623	247			321			25 - WB	33 - WB	38 - WB
Belknap Road, west of Edgell Road:										
Weekday Daily	7,236	649	8.96	69% WB	696	9.61	63% EB			
Eastbound	3,496	448			284			25 - EB	30 - EB	33 - EB
Westbound	3,740	284			440			25 - WB	30 - WB	34 - WB

[a] Vehicles per Day
[b] Vehicles per Hour.
[c] Percentage of daily traffic occurring during the peak hour.
[d] EB = eastbound, WB = westbound
[e] Miles per Hour
[f] Speed at which 85% of vehicles are operating at or below.

COLLISION HISTORY

Collision data for Belknap Road within the study area was obtained from the Massachusetts Department of Transportation (MassDOT) for the most recent three-year period available (2011 through 2013). A summary of the collision data along the study roadway is provided in **Table 2.**

Table 2
BELKNAP ROAD COLLISION HISTORY SUMMARY
between Pleasant Street (Route 30) and Edgell Road

Number of Crashes		Severity [a]			Collison Type [b]					
Total	Average per Year	PD	PI	F	CM	RE	HO	FO	Ped	Commuter Peak [c]
22	7.33	12	10	0	9	5	2	6	0	47.8%

Source: Massachusetts Department of Transportation Crash Records (2011 to 2013)
[a] PD = property damage only; PI = personal injury; F = fatality
[b] CM = cross movement/angle/sideswipe; RE = rear end; HO = head on; FO = fixed object; Ped = pedestrian.
[c] Percent of vehicle incidents that occurred during the weekday AM and weekday PM commuter peak periods

In addition to the crash summary, collision occurrence should be compared to the volume of traffic along a particular roadway to determine any significance. Accordingly, the crash rate was calculated for the entire length of Belknap Road and compared with the statewide crash rate averages for urban minor arterials.

A roadway crash rate is a measure of the total number of located crashes and the vehicle miles traveled for each roadway. The crash rate is presented in collisions per million vehicle miles traveled (c/mvmt). For urban minor arterials, the average statewide crash rate is 3.65 c/mvmt. A comparison of the calculated crash rate of Belknap Road (within the study limits) to the statewide can be used to establish the significance of collision occurrence and whether or not potential safety problems exist.

From the three years of data provided by MassDOT, Belknap Road experienced 22 reported collisions. This equates to a calculated crash rate of 2.18 c/mvmt, which is below the statewide average for urban minor arterials.

Eight (8) reported collisions occurred in 2011, five (5) occurred in 2012, and nine (9) occurred in 2013. Of the reported collisions:

- Ten (10) resulted in non-fatal injuries and twelve resulted in property damage only.

- Six (6) were single car collisions, 3 of which involved a vehicle striking a utility pole and 1 each involving a vehicle striking an animal, a vehicle striking a tree, and a vehicle driving off into a ditch.

- Sixteen (16) collisions occurred at intersections along the segment of Belknap Road:

    - One (1) at Pleasant Street (rear-end),
    - One (1) at Monterey Lane (angle),
    - One at Woodmere Road (angle),
    - One at Millwood Street (angle),
    - One at Mill Street (sideswipe, opposite direction),
    - Two (2) at Grove Street (one head-on, one rear-end), and
    - Nine (9) at Edgell Road (five sideswipe, three rear-end, one head-on)

All of the reported collisions occurred on dry pavement conditions and all but one occurred during daytime conditions. The crash rate worksheet is provided in Appendix D.

It should be noted that there may have been several other minor collisions to occur within the study limits on Belknap Road that were not officially reported. These crashes usually involve minor property damage which is not reported by the motorist. Although there is anecdotal evidence of additional crashes, these are not included in the crash rate calculations.

Figure 2 depicts collision locations for the 22 reported collisions from the MassDOT database for the three-year study period (2011-2013). Detailed collision data is included in Appendix D.

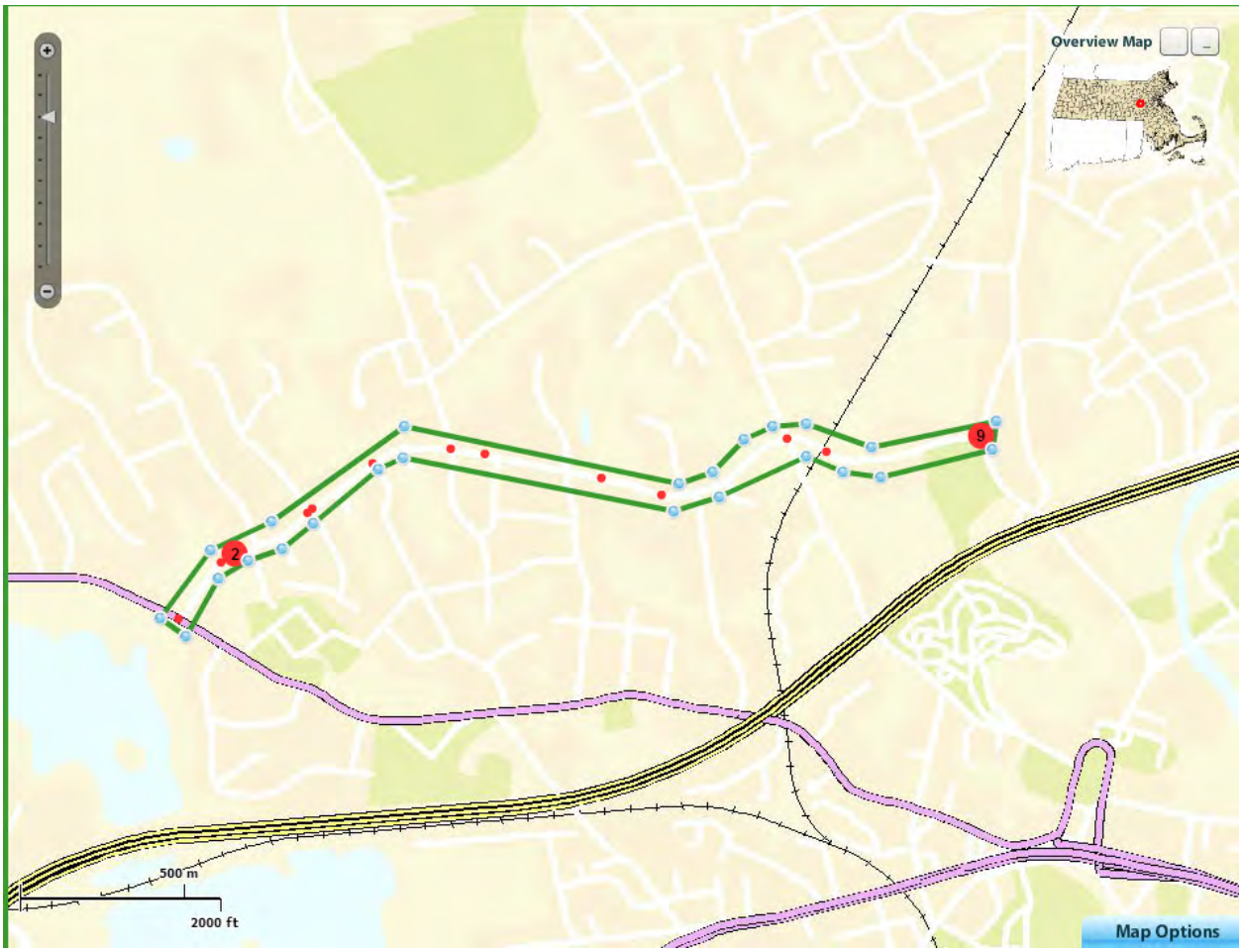


Figure 2
MassDOT Reported Collision Locations (2011-2013)

GEOMETRIC & SIGHT DISTANCE LIMITATIONS

At various locations along Belknap Road, the geometrics (curvature, width, etc.) of the roadway present conditions which may contribute to safety concerns. The majority, but not all, of these conditions are related to sight distance limitations due to lack of defined clear zones adjacent to the travel way. In most cases the roadway curvature is adequate given the design speed/posted speed limit of the roadway. It should be noted that the design speed is not the actual operating speed observed on the roadway.

The term clear zone is used to designate the unobstructed, traversable area provided beyond the edge of the traveled way for the recovery of errant vehicles. The clear zone includes shoulders, bicycle lanes, and auxiliary lanes. Along curves, clear zones play a particularly important role as they minimize roadside obstructions which may limit line of sight along the inside of a curve.

Design standards indicate that arterial roads similar to Belknap Road should be designed with standard lane widths of 11 to 12 feet and an additional 4 to 12 feet of usable shoulder. Clear zones of 12 to 16 feet are advised to be provided. Belknap Road ranges from 20 to 26 feet of paved width, with no marked shoulders along the corridor. In addition, lateral obstructions in the form of trees, utility poles, etc. are generally within 1 to 2 feet of the paved surface.

The horizontal/vertical curves of the roadway combined with the lack of shoulders and roadside clear zones are significant contributing factors to safety concerns along Belknap Road.

Sight Distance

Sight distances have been evaluated at intersections along Belknap Road to identify safety concerns associated with the lack of visibility around the horizontal and vertical curves. More specifically, sight distances were measured to determine if the available sight distances for vehicles along Belknap Road meet or exceed the minimum distances required for vehicles to safely stop for an obstruction in the roadway. The available sight distances were compared with minimum requirements, as established by the American Association of State Highway and Transportation Officials (AASHTO).[3] AASHTO is the national standard by which vehicle sight distance is calculated, measured, and reported.

Sight distance is the length of roadway ahead that is visible to the driver. The Stopping Sight Distance (SSD) is the minimum distance required for a vehicle traveling at a certain speed to safely stop before reaching a stationary object in its path. The SSD is measured from an eye height of 3.5 feet to an object height of 2 feet above street level, equivalent to the taillight height

[3] *A Policy on Geometric Design of Highways and Streets: 2004*. Washington, D.C.: American Association of State Highway and Transportation Officials, 2004.

of a passenger car. The SSD is measured along the centerline of the traveled way of the major roadway.

The Intersection Sight Distance (ISD) is provided on minor street approaches to allow the drivers of stopped vehicles a sufficient view of the major roadway to decide when to enter the major roadway. By definition, the ISD is the minimum distance required for a motorist exiting a minor street to turn onto the major street, without being overtaken by an approaching vehicle reducing its speed from the design speed to 70 percent of the design speed. The ISD is measured from an eye height of 3.5 feet to an object height of 3.5 feet above street level. The use of an object height equal to the driver eye height makes ISD reciprocal (i.e., if one driver can see another vehicle, then the driver of that vehicle can also see the first vehicle).

The SSD is generally more important as it represents the minimum distance required for safe stopping while the ISD is based only upon acceptable speed reductions to the approaching traffic stream. The ISD, however, must be equal to or greater than the minimum required SSD in order to provide safe operations at an intersection. In accordance with the AASHTO manual, *"If the available sight distance for an entering or crossing vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions. However, in some cases, this may require a major-road vehicle to stop or slow to accommodate the maneuver by a minor-road vehicle. To enhance traffic operations, intersection sight distances that exceed stopping sight distances are desirable along the major road."* Accordingly, the ISD should be at least equal to the distance required to allow a driver approaching the minor roadway to safely stop.

The available SSD and ISD at the intersecting side street locations along Belknap Road were measured and compared to minimum requirements as established by AASHTO. Since the distance required to stop a vehicle is dependent on the speed of that vehicle, speed studies were conducted as presented in the *Volume and Speed Data* section of this memorandum. Based on the posted 25 MPH speed limit within the study area and the observed speeds, the SSD and ISD requirements at the side street locations were calculated. The required minimum sight distances for each speed are compared to the available distances, as shown in Table 3.

Table 3
SIGHT DISTANCE SUMMARY

	Stopping Sight Distance (feet)		Intersection Sight Distance (feet)		
Location/Direction	Measured	Minimum Required [a]	Measured	Minimum Required [b]	Desirable [c]
Belknap Road at Flanagan Drive					
East of Intersection	274	261	250	**261**	**400**
West of Intersection	400	230	330	230	**365**
Belknap Road at Monterey Lane					
East of Intersection	460	261	380	261	**400**
West of Intersection	258	230	171	**230**	**365**
Belknap Road at Major Hale Drive					
East of Intersection	+500	261	+500	261	400
West of Intersection	374	230	260	230	**365**
Belknap Road at Woodmere Road					
East of Intersection	273	261	270	261	**400**
West of Intersection	418	230	206	**230**	**365**
Belknap Road at Bellwood Road					
East of Intersection	500+	283	500+	283	420
West of Intersection	457	283	457	283	420
Belknap Road at Knight Road (north)					
East of Intersection	500+	283	460	283	420
West of Intersection	500+	283	239	**283**	**420**
Belknap Road at Knight Road (south)					
East of Intersection	500+	283	480	283	420
West of Intersection	500+	283	463	283	420
Belknap Road at Mill Street					
East of Intersection	310	283	176	**283**	**420**
West of Intersection	458	283	396	283	**420**
Belknap Road at Edgell Road					
North of Intersection	500+	240	500+	240	375
South of Intersection	471	240	460	240	375

[a] Values based on AASHTO requirements for 85th percentile speeds in the vicinity.
[b] Values based on AASHTO requirements for SSD.
[c] Values based on AASHTO ISD guidelines for 85th percentile speeds in the vicinity.

The SSD is met at all of the intersections in the study area. However, in some cases, a vehicle traveling on Belknap Road will almost come to a complete stop in order to allow a vehicle turning from a side street to enter the traffic flow. Additionally, ISD is below both the minimum and/or desirable distances at a number of intersections. The impact of the ISD below the desired length is that a motorist traveling on Belknap Road will need to significantly adjust speed if another motorist exits from a side street.

Existing Areas of Concern

As indicated in Table 3, all nine locations meet the minimum stopping sight distance requirements. However, as also provided in Table 3, and as described below, there are a number of areas of concern along the Belknap Road corridor. These areas are summarized below and are highlighted in Figure 1:

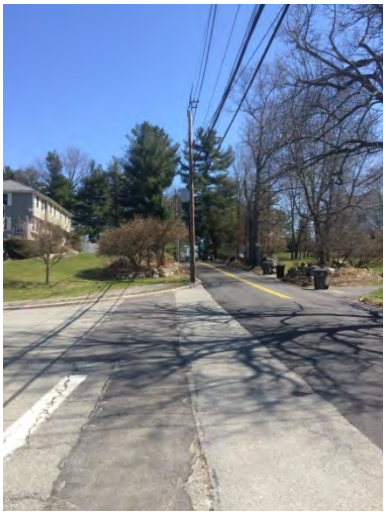
- Belknap Road consists of one 10 to 13-foot travel lane in each direction with no shoulder or clear zone outside of the paved surface. The lack of shoulders provide very little room for vehicle recovery.

- Horizontal curves are present on Belknap Road just west of Flanagan Drive. Caution signs, such as chevrons or Curve Ahead (W1-2R) signs are not provided to warn motorists of pending curves. The crash reports noted above indicate that there were 3 single vehicle crashes in this location in which a vehicle struck either a utility pole on the northern side of Belknap Road or lost control and struck the ditch on the southern side of Belknap Road. It should be noted that there is no guardrail along this curve.

- **Flanagan Drive.** There are sight distance restrictions exiting Flanagan Drive due to several factors, including the horizontal curve on Belknap Road to the west, the vertical crest curve to the east, and roadway vegetation along the northern side of Belknap Road. These restrictions affect the ability of motorists turning from Flanagan Drive onto Belknap Road. Although the stopping sight distances are provided in each direction, the minimum required intersection sight distance is not met looking to the east of Flanagan Drive. Additionally, the desirable intersection sight distance is not met in both directions.

  In addition, there is a marked crosswalk at this intersection, with rectangular rapid flashing beacons and advanced school zone flashers. The roadway alignment within the vicinity of this crossing (horizontal curve to the west and vertical crest to the east) limits sight distance at this location making this a potentially hazardous crossing.

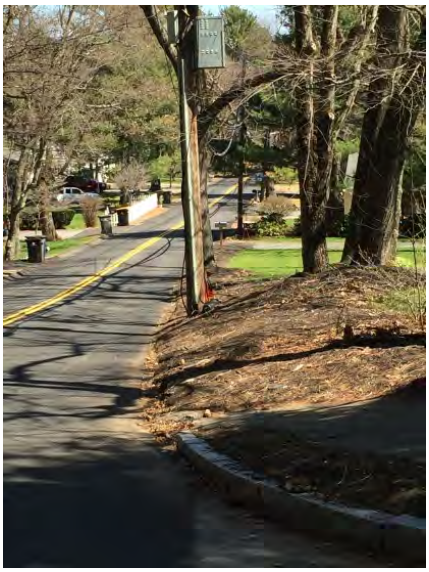
Looking west at Flanagan Drive



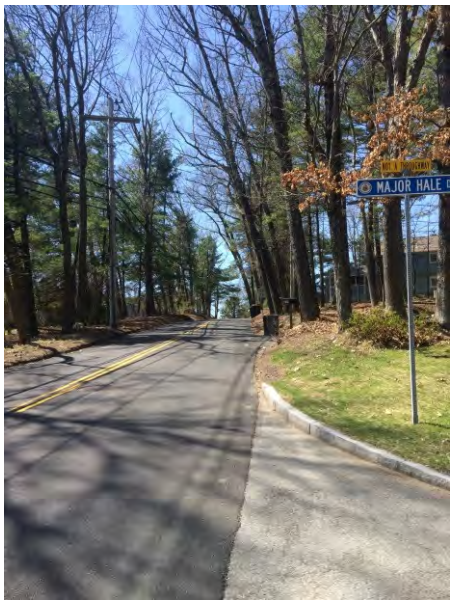
Looking east at Flanagan Drive

- **Monterey Lane/Major Hale Drive.** Intersection sight distance (ISD) restrictions are present to motorists at the Monterey Lane/Major Hale Drive intersection with Belknap Road due to lack of clear zones, vegetation, and the vertical crest just west of Monterey Lane. These restrictions affect vehicles turning from the two side streets, as well as through vehicles traveling eastbound on Belknap Road.

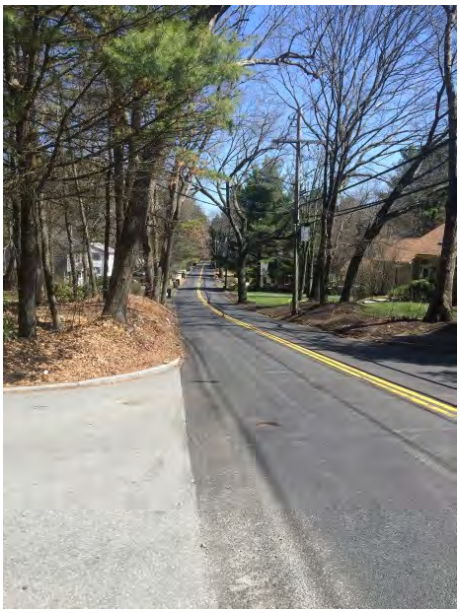
Looking west at Monterey Lane



Looking east at Monterey Lane

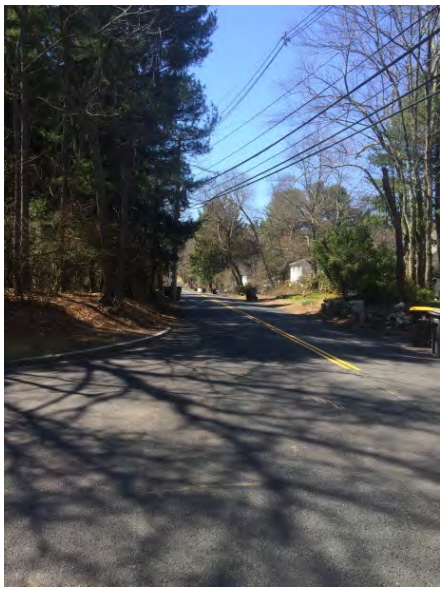


Looking west at Major Hale Drive



Looking east at Major Hale Drive

- **Woodmere Road.** Roadside features (tree and utility pole) just west of Woodmere Road affect intersection sight distances in this area. These features present a potential conflict between left turning vehicles from Woodmere Road onto Belknap Road and through vehicles traveling eastbound on Belknap Road.



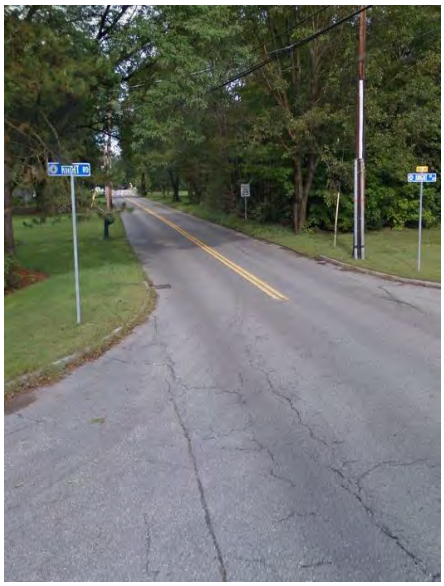
Looking west at Woodmere Road

Looking east at Woodmere Road

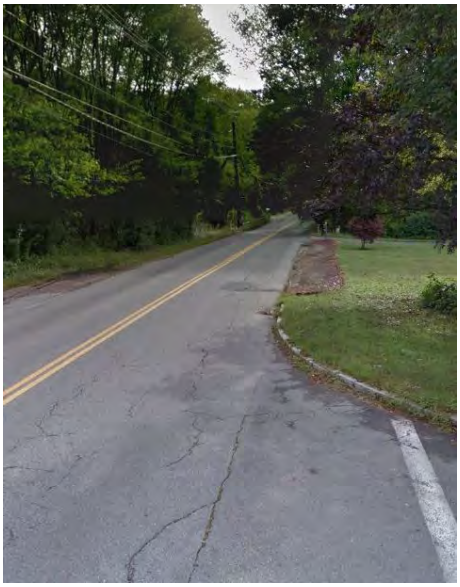
- **Knight Road.** Intersection sight distance (ISD) restrictions due to lack of clear zones, roadside vegetation and utility pole location are present to the west of Knight Road. These restrictions affect motorists turning left from the north side of Knight Road and the through vehicles traveling eastbound on Belknap Road.

Looking west at Knight Road (from North)

Looking east at Knight Road (from North)



Looking west at Knight Road (from South)



Looking east at Knight Road (from South)

- **Mill Street.** Intersection sight distance (ISD) restrictions due to lack of clear zones, roadside vegetation and horizontal curves on either side of Mill Street. Minimum ISD is not met east of Mill Street due to the sharp horizontal curve on Belknap Road and significant roadside vegetation. It should be noted that stopping sight distance is barely met (exceeds minimum by approximately 30 feet). Desirable ISD is not met west of Mill Street.

Looking west at Mill Street

Looking east at Mill Street

Based on an engineering review, it has been determined that the remaining horizontal and vertical geometry on Belknap Road is adequate for the posted speed of the roadway. However, two prevailing safety deficiencies have been identified along Belknap Road as part of this assessment:

1. Elevated Vehicle Speeds
2. Lack of Roadside Clear Zones
3. Edgell Road Geometrics

The use of traffic calming measures to address elevated vehicle speeds is justified, however it must be recognized that these measures will not address the lack of roadside clear zones. Additional consideration should be given to improving the roadside clear zone, although given the Scenic Road designation, this would require Planning Board Approval.

TYPICAL TRAFFIC CALMING MEASURES

Traffic calming devices generally fall into two categories: 1) those elements which directly provide volume control and 2) those measures which primarily provide speed control. Commonly used traffic calming measures for volume control include full and half road closures as well as physical diverters. Volume control measures are not recommended for Belknap Road and these elements are not considered to be applicable for this effort.

Common speed control traffic calming measures are described below. Some devices should not be considered on Belknap Road due to existing constraints as described below. These elements are noted and are not recommended for further consideration.

Pavement Markings

Pavement Markings can be used as traffic calming measures that regulate traffic movements in lieu of or in combination with other physical changes to the roadway. The addition of striping a defined centerline and shoulder have been shown to have a calming effect on traffic particularly in locations where pavement markings had previously not existed.

A double yellow center line is provided along the extents of Belknap Road within the study area. ***The painting of white shoulder lines should be considered. In addition, striped crosswalks, "STOP", "STOP AHEAD", and "SCHOOL ZONE" pavement markings can also be considered.***

Curb Extensions

These are physical devices which reduce the roadway width from curb to curb. When placed at intersections these devices are referred to as neckdowns and when applied at midblock locations curb extensions are referred to as chokers. Chokers force vehicles to slow while maneuvering through narrow points along the roadway while neckdowns at an intersection lead to tighter turning radii, also forcing vehicles to slow. Both devices offer additional safety benefits to pedestrians by reducing crossing width and creating areas

Curb Extensions

Due to the lack of the relatively narrow existing width of Belknap Road, the use and construction of curb-extensions is ***not practical.***

Chicanes

Chicanes are S-shaped curve realignments of a normally straight roadway, which encourages slower speeds.

Chicanes

Due to the lack of consistent roadside curbing throughout the corridor, the relatively narrow existing width of Belknap Road, and the minor urban arterial classification of Belknap Road, the use and construction of chicanes is ***not feasible****.*

Center Island

Center islands are raised medians along the roadway centerline. They typically narrow the travel lanes, separate opposing traffic movements and may introduce a slight travel path deflection. When landscaped, they can improve the aesthetics of the corridor. They are feasible without major roadway changes when the right-of-way is available within the existing pavement width. Center islands may also be painted, but these are less effective than raised center islands, since vehicles can traverse a painted island.

Center Island

Due to the lack of roadside curbing and the relatively narrow existing width of Belknap Road, the use and construction of center islands is ***not feasible.***

Gateway

Gateway features can be used to identify a change in the roadway environment for vehicles entering the traffic calming management area. Monuments or other landscaping devices can be used to signify a change in the area type. Gateways are often combined with other traffic calming elements.

Gateway

Consideration could be given to use of gateway features at the Belknap Road intersection with Edgell Road. These features can be incorporated with other improvements to this location, including the narrowing of the Belknap Road approach by using smaller radii, as well as crosswalk and ADA-compliant wheelchair ramp improvements.

Roundabouts/Neighborhood Traffic Circles

Roundabouts/mini-traffic circles consist of placing raised islands within an intersection around which traffic circulates in a counterclockwise direction. These devices have been shown to reduce vehicle speeds and improve safety. Mini traffic circles usually have 4-way stop control. Roundabouts (which have additional design characteristics) are often deployed at higher volume intersections.

Due to the classification of Belknap Road as an urban minor arterial, the use and construction of roundabouts/neighborhood traffic circles are ***not feasible.***

Neighborhood Traffic Circle

Speed Bumps

Speed Bump

Speed bumps are often the devices which come to mind when discussing traffic calming devices. Speed bumps were used in previous generations of traffic calming. They are narrow and often abrupt. Today they are found along private roadways and within parking lots.

Speed bumps are not being considered as part of this effort.

Speed Humps

Speed humps are asphalt or rubber mounds that cover the full width of the roadway. Speed humps are typically 3 to 3.5 inches in height and 12 to 14 feet long. They have been shown to slow vehicles to 20-23 mph to traverse. However, recent data from installations in the Town of Framingham indicate that drivers negotiate speed humps at slightly greater speeds (26 to 28 mph).

Speed Hump

Speed humps are not applicable to minor urban arterials such as Belknap Road.

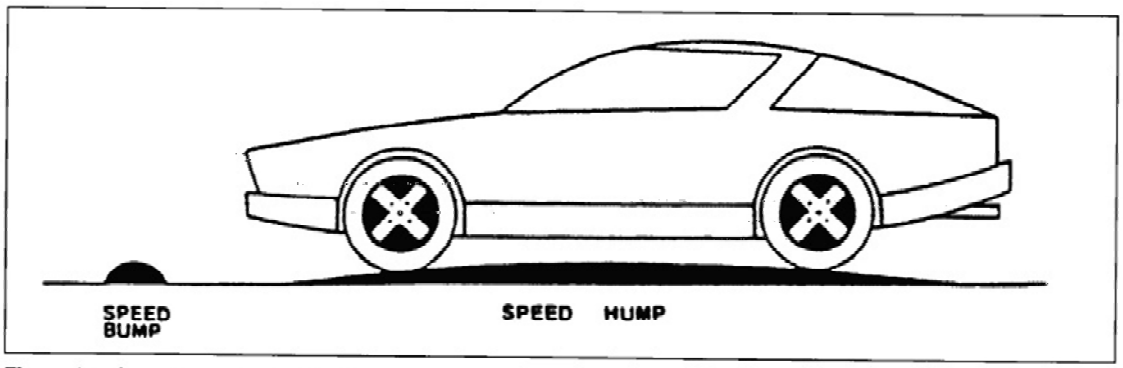


Figure 1.1. Speed hump vs. speed bump.

Speed Table

Speed Tables

Speed tables are essentially speed humps that have been modified with a flat top. Speed tables are also typically 3 to 3.5 inches in height but are generally 22 feet long (10 foot plateau and two 6 foot ramps). They have been shown to slow vehicles to 25-30 mph to traverse. The flat top is typically long enough for the entire wheelbase of a passenger car to rest on and the ramps are sloped gently for a more gradual slowing of vehicles than speed humps. The flat top allows a higher design speed and smoother ride than humps. Speed tables are more desirable to emergency vehicles than speed humps as they are less jarring. When used in conjunction with a crosswalk speed tables are considered raised crosswalks.

Speed tables are not applicable to minor urban arterials such as Belknap Road.

Speed Lumps/Cushions

Speed lumps/cushions are speed humps with the wheel base of an emergency vehicle removed so these vehicles can proceed unimpeded. While these devices introduce the possibility of calming traffic without introducing additional delay to emergency response times, these devices are a relatively new form of traffic calming and the industry knowledge is still forming as to their effectiveness.

Speed lumps/cushions are not applicable to minor urban arterials such as Belknap Road.

Speed Lumps/Cushions

Raised Intersection

Raised Intersections

A raised intersection is a raised plateau implemented throughout an entire intersection with ramps along all approaches. While considered to be the most expensive of traffic calming options, these devices have the benefit of calming two roadways at one location. These devices also increase pedestrian safety throughout the entire intersection.

Raised intersections are not applicable to minor urban arterials such as Belknap Road.

Active Driver Feedback Signs

Active Driver Feedback Signs are radar activated signs that dynamically display approaching speeds for individual vehicles or display messages such as "SLOW DOWN" or "REDUCE SPEED" when a vehicle exceeds a certain speed. They alert drivers that they are speeding and create a sense of being monitored. They can be portable or permanent.

Active Driver Feedback Signs could be considered along Belknap Road.

Active Driver Feedback Sign

It should be noted that advanced warning signs are necessary to warn drivers of many of the proposed traffic calming devices. In addition to advanced warning signs the use of reflectorized object markers and/or bollards may be necessary to facilitate plowing operations.

Finally it is important to note that while individual traffic calming devices will slow vehicles in the general vicinity of the device, to achieve corridor wide speed reductions will require proper spacing of devices. If spaced too far apart vehicles will accelerate back to preferred speeds between devices. Design guidance indicates a preference of **500 feet between devices** to achieve adequate speed control.

CONCEPTUAL TRAFFIC CALMING PLAN

GPI's observations and data collection support the consideration of traffic calming measures to target the reduction of vehicle speeds along Belknap Road. However, the appropriate opportunity to use traffic calming measures is limited. While the use of traffic calming measures could provide some reduction in vehicle speeds, they will not address the need for additional clear zones along Belknap Road, nor the inadequate sight distances.

Unlike most of the residential streets in this part of Framingham, Belknap Road is classified as an urban minor arterial roadway. In addition, traffic volumes on Belknap Road are significantly greater than other streets where traffic calming has recently been proposed or constructed. As an arterial street, a number of the traditional traffic calming measures (speed humps, speed tables, speed lumps, etc.) are not applicable in accordance with both MassDOT policies and the Town's "Policy on Traffic Calming Measures".

The recommendations presented below are approaches that GPI believes may help to improve safety along the corridor, and potentially lower vehicular speeds. Figure 3 presents the types of proposed traffic calming devices and the associated locations under this conceptual plan. Traffic calming elements were focused on areas which have both geometric limitations and a demonstrative safety need.

General

The following recommendations are not specific to any one location, but should be considered along the entire Belknap Road corridor:

- **Pavement Markings** – Belknap Road is currently marked only with a double yellow centerline. The existing pavement width varies along the corridor from 20 to 26 feet, while an arterial should provide 11 to 12 foot lanes. Where pavement width allows, white edge lines can be applied.

  In addition, pavement legends may be added to caution motorists of potential actions that must be taken, including "STOP AHEAD", "STOP" and "SCHOOL ZONE" at appropriate locations along the corridor.

- **Complete Streets –** The designation of Belknap Road as a Scenic Road makes any meaningful widening of the roadway difficult without Planning Board approval. However, pavement markings and "SHARE THE ROAD" signs can be installed to remind motorists that other forms of transportation are entitled to use the roadway. These measures how remind motorists that bicyclists and pedestrians may be on the roadway, and help to slow travel speeds.

- **Signing** – In general, many of the existing signs no longer comply with current federal regulations with respect to retroreflectivity. In addition, caution signs such as "CURVE AHEAD" with supplemental speed placards are virtually non-existent on Belknap Road. All signs should be upgraded and supplemented as needed throughout the corridor.

Specific Locations

- **West of Belknap Road** - Install chevron signs in both directions for reverse curve on Belknap Road west of Flanagan Drive. Curve Ahead (W1-2L) signs should also be installed.

- **Belknap Road -** Upgrade existing School Speed Limit flashing beacons to meet MUTCD requirements with LED displays. The upgraded beacons could also incorporate a supplemental "Your Speed" active feedback sign to note the actual speeds of motorists.

- **Millwood Street/Clearview Drive** – Install "STOP AHEAD" signs on all four approaches to the intersection, and consider supplemental pavement legends. Install "ALL-WAY" supplemental placards to the existing stop signs.

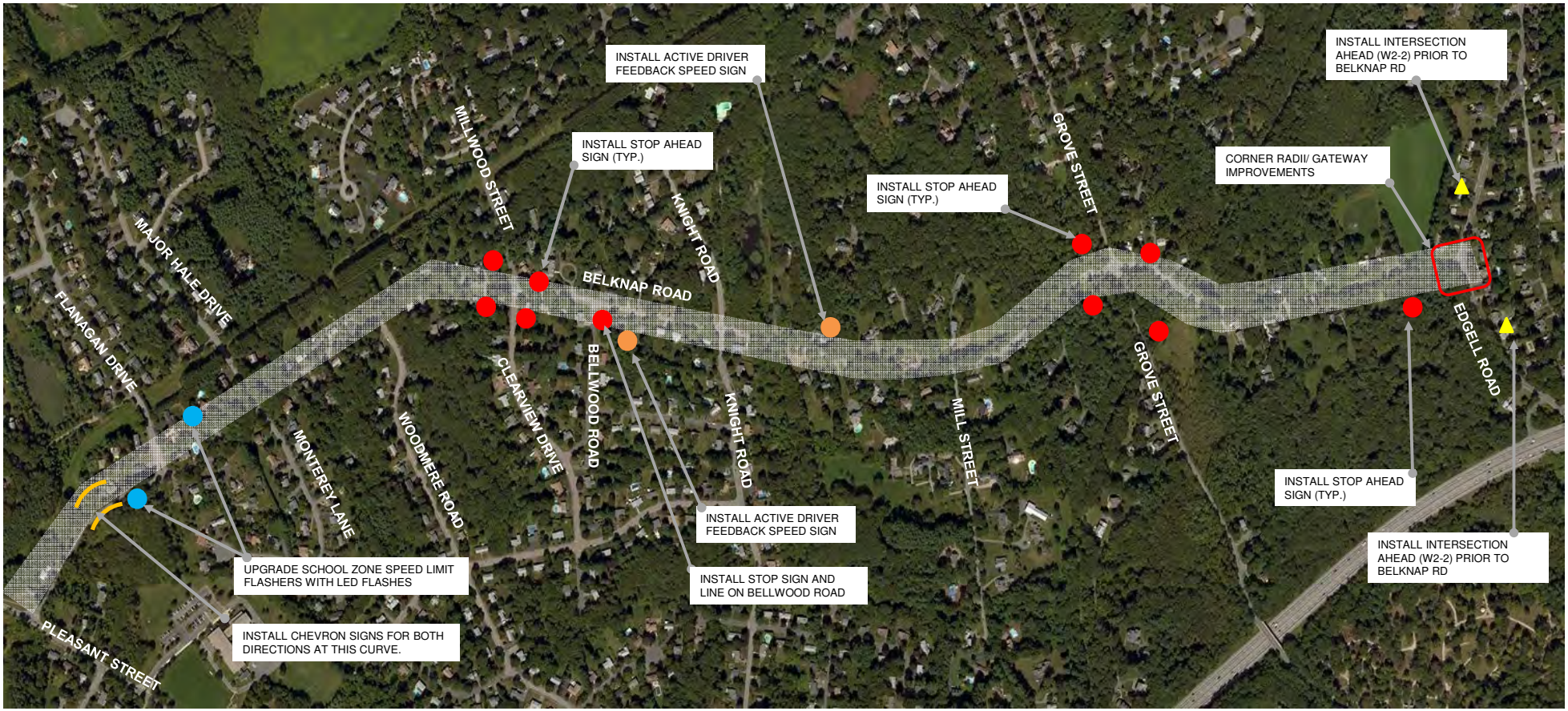
- **West and East of Knight Road** – Install Active Drive Feedback Signs on Belknap Road in the general vicinity of Knight Road. This section of Belknap Road is both straight and fairly level, which encourages motorists to increase speed (the 85^{th} percentile speed in this area is the highest of the locations surveyed).

- **Grove Street** – Install "STOP AHEAD" signs on all four approaches to the intersection, and consider supplemental pavement legends.

- **Edgell Road –** Provide geometric modifications to this intersection to reduce the corner radii onto Belknap Road. This would help to reduce the speeds of vehicles turning right onto Belknap Road from Edgell Road. In addition, reducing the size of the radii will allow for the relocation of the stop sign and line closer to Edgell Road from its current location. In addition, a crosswalk should be provided along with ADA-compliant ramps crossing Belknap Road.

  Additionally, landscaping and other features could be used on the Belknap Road approach to the intersection to indicate to motorists turning from Edgell Road that Belknap Road is a largely residential street.

Figure 3
Belknap Road- Proposed Traffic Calming Measures



GPI Greenman-Pedersen, Inc.
Engineering and Construction Services

CORRIDOR IMPROVEMENTS
- WHITE EDGE PAVEMENT MARKINGS
- STOP AHEAD, SCHOOL ZONE, ETC. MARKINGS
- SHARED THE ROAD MARKINGS/ SIGNING
- CAUTION SIGNS (CURVE AHEAD, CHEVRONS, ETC.)

Appendices

A. RESIDENTS' PETITION/TRSC MEETING MINUTES
B. SPEED ZONE REGULATIONS
C. TRAFFIC VOLUME & SPEED DATA
D. COLLISION DATA
E. ADDITIONAL TRAFFIC CALMING INFORMATION

A. RESIDENTS' PETITION/TRSC MEETING MINUTES

TOWN OF FRAMINGHAM
TRAFFIC AND ROADWAY SAFETY COMMITTEE

"Dedicated to Excellence in Public Service"

February 10, 2016 7:00 PM

DPW Training Room
DPW Building
100 Western Avenue
Framingham, MA 01702

Members Present: Chairman Eric V. Johnson, Lt Robert Downing, Deputy DPW Director Paul G. Barden, Deputy Chief Steven Trask, Selectman Charles Sisitsky, Fire Marshal Joe Hicks, Planning Board Member Thomas F. Mahoney

1. **Consider the implementation of traffic calming measures along Belknap Road.** Ms. Tanya Lipp, of 45A Flanagan Drive, was the main advocate for installing traffic calming measures along this street. She was the one who circulated the Traffic Calming Request form, and stated that with the removal of the crossing guard in the area and along with visibility issues, due to elevation changes and vegetation, motorists are ignoring the posted speed limits and are speeding through the area. Selectwoman Cheryl Tully-Stoll also spoke to the committee about this area being treacherous and supports Ms. Lipp in her request. Several other residents in the neighborhood spoke in favor if the request. The Police Department presented speed data for the area and there does appear to be a speeding issue. **Motion:** Recommend that a consultant be hired to perform a Traffic Calming Needs Assessment on this section of Belknap Road. **Vote:** Unanimous.

2. **Consider the implementation of a parking restriction in front of 36 Second Street.** Several women from the Church on 36 Second Street were in attendance and were requesting a parking restriction in front of the church and to have it as church parking only. The committee stated that this would be unenforceable. The Police Department volunteered to go down to see if the driveway to the property was being blocked. This would be a ticketable offense. **Motion:** No Action Taken. **Vote:** N/A.

3. **Consider the implementation of parking restrictions along the ODD side of Kellogg Street, between Central Street and Prospect Street.** Ms. Peschier, a resident of Kellogg Street stated that parking has been an ongoing issue in this area for over four years.

Vehicles that park on the odd side of the street blocks people's access to their homes. Lt. Downing said that she should call the Framingham Police Department and she can have a conversation with the Lt. and then he can have a discussion with the adjacent school. A bus driver for the school stated that the school tells them to park on Central Street when waiting to pick up the children. Lt. Downing said he would work with the school on this parking situation. **Motion:** N/A. **Vote:** N/A.

4. **Determine which side of the street is ODD and which is EVEN for Wilson Street between Bishop Street and the Natick Town Line.** Mr. Johnson stated that the eastern half of Wilson Street had a very quirky house numbering system. He also talked about the Town wide odd/even parking regulation and how the Town has limited enforcement personnel. A resident of 55 Wilson Street stated that the condos in the area are a big part of the parking issue. **Motion:** Recommend to the Board of Selectmen that the north side of Wilson Street be the even side and that the south side of Wilson Street be the odd side. This would match the numbering system of Wilson Street, west of Bishop Street. **Vote:** Unanimous.

5. **Consider the implementation of a One Way designation for Franklin Street between Howard Street and the MBTA Commuter Rail Parking Lot.** The committee was not aware if the Town could legally end a one-way street on private property. This would require a motorist to travel onto private property before they would be able to get back onto a public street. **Motion:** Recommend to the Board of Selectmen that Franklin Street be one way (SB) after the intersection of Howard Street, only after receiving a recommendation from Town Counsel. **Vote:** Unanimous.

6. **Consider the installation of "No Parking 8:30-9:30AM on school days" signage on the sidewalk side of Turner Road.** This was a revisit from the January 2016 TRSC meeting. The specific neighborhood was provided informational flyers and only one resident called the Engineering Department. Mr. Dick Dixon, of 23 Turner Road, stated that some parents need to drop off kids and walk them into the school. Mr. Bob Valukis, of 15 Turner Road, was ok with the restriction on the other end of Turner Road but not in front of his property. Ms. Andrea Cardarelli, the original proponent of the restriction, only wanted signage between 21 – 23 Turner Road. Mr. Leonard Finberg, of 22 Turner Road, stated that he already has a No Parking restriction in front of his house. Mr. Peter Ayer, of 84 Griffin Road, stated that many parents will not move their vehicles and practically take over the entire road. **Motion:** To recommend to the Board of Selectmen that No Parking be allowed, starting between the properties of 17 and 19 Turner Road and extending west to Griffin Road, from 8:30AM to 9:30AM, during school days. **Vote:** Unanimous.

7. **Discuss the Edgell Road/Central Street intersection and provide an update on safety initiatives for that location (accidents, redesign, etc.).** Mr. Sisitsky talked about looking

at the entire length of Edgell Road as a corridor project and about the time and money it would take to construct this project. The second approach would be to take this on piece by piece and intersection by intersection. The Town Manager was also asked to approach the TIP Committee to have this work performed. Mr. Sisitsky was advocating for small intersection projects. Audrey Hall was talking about this intersection on a Facebook Group. The Group was complaining about the intersection and people cannot understand why the Town is not doing anything. Lisa, a resident on Edgebrook Road, had a concern about this intersection and also the intersection of Edgell Road at Edgebrook Road. Mr. Johnson states that the Central / Edgell intersection may become a traffic signal controlled intersection. He also stated that Edgell Road has very old utilities underneath. With Union Avenue undergoing a large utility project this upcoming season, it would not be a good idea to have Edgell Road be under construction as well. Ms. Hall was also provided with accident data for the intersection of Central Street and Edgell Road. **Motion:** Take no action. **Vote:** Unanimous.

8. **Consider parking restrictions along Edwards Street.** Matt Torti from the School Department discussed traffic problems that are occurring during school hours at Stapleton School, especially during morning drop off and evening pick up. Buses are not able to make the corner of Maplewood Street at Edwards Street. **Motion:** Recommend to the Board of Selectmen to implement a parking restriction along the south side of Maplewood Street, at the intersection with the school driveway and extending around the corner onto Edwards Street. **Vote:** Unanimous.

9. **Approval of Meeting Minutes (January 13th, 2016).** **Motion:** Approve the January 13th minutes. **Vote:** Approved 7-0.

10. **Next Meeting Date: Tentatively March 9th, 2016**

DOCUMENTS DISCUSSED:

- **Images for items 1-8.**
- **Traffic Calming Request Form, Several Letters, and Speed Data for Item 1.**
- **Email correspondence for Item 2, 4, and 7.**
- **ClickFix Print Out for Item 3.**
- **Letter for Item 5.**
- **Email and previous TRSC minutes for Item 6.**
- **Email, plans, and photo for Item 8.**

Meeting adjourned at 9:15 PM.

APPROVED: March 30, 2016

OPERATIONS CENTER | 100 WESTERN AVENUE | FRAMINGHAM, MASSACHUSETTS 01702 | TEL 508-532-6010 | FAX 508-424-3428

TOWN OF FRAMINGHAM
TRAFFIC AND ROADWAY SAFETY COMMITTEE

"Dedicated to Excellence in Public Service"

February 10, 2016 7:00 PM

DPW Conference Room
DPW Building
100 Western Avenue
Framingham, MA 01702

AGENDA

1. Consider the implementation of traffic calming measures along Belknap Road.
2. Consider the implementation of a parking restriction in front of 36 Second Street.
3. Consider the implementation of parking restrictions along the ODD side of Kellogg Street, between Central Street and Prospect Street.
4. Determine which side of the street is ODD and which is EVEN for Wilson Street between Bishop Street and the Natick Town Line.
5. Consider the implementation of a One Way designation for Franklin Street between Howard Street and the MBTA Commuter Rail Parking Lot.
6. Consider the installation of "No Parking 8:30-9:30AM on school days" signage on the sidewalk side of Turner Road.
7. Discuss the Edgell Road/Central Street intersection and provide an update on safety initiatives for that location (accidents, redesign, etc.).
8. Consider parking restrictions along Edwards Street.
9. Approval of Meeting Minutes (January 13, 2016).
10. Next Meeting Date: Tentatively – March 9, 2016.

BELKNAP ROAD

Legend

- Parcel Boundaries
- Edge of Pavement

TOWN OF FRAMINGHAM
DEPARTMENT OF PUBLIC WORKS
ENGINEERING AND TRANSPORTATION DIVISION
GEOGRAPHIC INFORMATION SYSTEMS MAP

CREATED BY: ADAM KIEL	
PREPARED FOR: FEBRUARY 2016 TRSC MEETING	
ERIC V. JOHNSON, TOWN ENGINEER	
PETER SELLERS, DIRECTOR	DATE: FEBRUARY 10, 2016

RECEIVED
DEC 09 2015
ENGINEERING DIVISION
PUBLIC WORKS DEPARTMENT

TRAFFIC CALMING REQUEST FORM
TOWN OF FRAMINGHAM

What is traffic calming? The goal of traffic calming is to make streets safer for pedestrians, bicyclists and motorists by implementing roadways with features that induce drivers to slow down and pay more attention to their surroundings. Three major categories of traffic calming include: (1) narrowing the real or apparent width of the street, (2) deflecting or introducing curvature to the vehicle path, and (3) altering the profile of the vehicle path.

Traffic Calming does not include the installation of regulatory traffic control devices such as signals, stop signs, or lowering a speed limit because they are not self-enforcing. A copy of the Framingham Policy on Traffic Calming Measures is available by visiting: http://www.framinghamma.gov/Weblink8/DocView.aspx?id=21918&dbid=0. Call the DPW – Engineering Department if you have any questions at (508) 530-6010.

Traffic Calming Request Form Directions: Please fill out this form and mail it to the address listed below. By using this form you will help us assess the type of issues or concerns you are having with a street in your neighborhood. Each request will be considered separately. We will place your request on the agenda for the Traffic and Roadway Safety Committee (the Committee) within sixty (60) days of receipt. Following a public hearing, the Committee will make a determination if this traffic calming request merits further consideration.

1. Name TANYA LIPP **Date** 12-8-15

Address 45A FLANAGAN DR
FRAMINGHAM MA 01701

Email TANYALIPP@VERIZON.NET

Phone (day) 617-306-2149 **(night)** 508-405-4035

2. Please list the street(s)/ location / intersection that concern you:
Belknap Rd from the Belknap Rd + Monterey LN intersection to 667 Belknap Rd. 667 Belknap Rd is located just past the school zone sign and houses a day care. The blind hill between Monterey and Flanagan Drive blocks the view of children and adults crossing at Belknap + Flanagan and at the bus stop. Drivers are not slowing.

3. What time of day do the concerns you have seem most noticeable?
We are most concerned with morning school bus/walking hours of 6:15 am – 9:20 AM and also afternoon hours between 2:30pm – 4:30pm when children are returning from school.

Attached: 1. Signatures from 11 Households on Belknap Rd
2. Signatures from 16 Households Flanagan Dr
3. Signatures from 4 Households Sullivan Terrace
4. Signatures from 1 Household Vigue Circle
5. Signatures from 7 Households Monterey Lane
6. 3 Letters from Concerned Residents on the Situation.

4. Please check each item below that applies to the referenced street(s):

✓ Pedestrian/Bicyclist Safety ✓ Speeding Vehicles ✓ Sign placement

✓ High traffic volume ___ Parking Issues ✓ Difficult to cross street

✓ Sight Distance Issues (for drivers) ✓ Poor Road Conditions __ Other (describe):

5. Required signatures. This form in the space provided below must contain signatures from at least ten (10) households or 50% of the residences or businesses on the street, whichever is less, for the town to begin consideration of a traffic calming plan. You can also obtain more signatures than the minimum to show local support for your request.

6. You may also attach a drawing on another sheet of paper if you think it will be helpful.

Please return this completed form to: Framingham Traffic & Roadway Safety Committee, c/o DPW – Engineering Division, 100 Western Avenue, Framingham, MA 01702

Name	*Signature*	*Address*
1. ARIF Noor		649 BELKNAP Rd, Framingham MA
2. Joyce Chase	Joyce Chase	651 Belknap Rd
3. Julia Donina		667 Belknap RD.
4. KathrynMorningstar	KathrynMorningstar	655 Belknap Rd
5. Heather Kurzman	HeatherKurzman	497 Belknap Rd.
6. Adam Kurzman		497 Belknap Rd.
7. Mary Perez		515 Belknap rd.
8. Paula Rader	Paula Rader	494 Belknap Rd.
9. Taylor Biggers	Taylor Biggers	395 Belknap Rd.
10. Brandon Strange		344 Belknap Rd
11. Nicole Strange	Nicole Strange	344 Belknap Rd
12. Maureen Precopio	Maureen Precopio	346 Belknap Road
13 Akila Ladha	Ladha	622 Belknap Road
		akilasladha@gmail.com

4. Please check each item below that applies to the referenced street(s):

✓ Pedestrian/Bicyclist Safety ✓ Speeding Vehicles ✓ Sign placement

✓ High traffic volume ___ Parking Issues ✓ Difficult to cross street

✓ Sight Distance Issues (for drivers) ✓ Poor Road Conditions __ Other (describe):

5. Required signatures. This form in the space provided below must contain signatures from at least ten (10) households or 50% of the residences or businesses on the street, whichever is less, for the town to begin consideration of a traffic calming plan. You can also obtain more signatures than the minimum to show local support for your request.

6. You may also attach a drawing on another sheet of paper if you think it will be helpful.

Please return this completed form to: Framingham Traffic & Roadway Safety Committee, c/o DPW – Engineering Division, 100 Western Avenue, Framingham, MA 01702

Name	*Signature*	*Address*
1. Alex Sukharsky		93 Flanagan Dr
2. Cathy McCarthy		81 Flanagan Dr
3. Loren Pfeffer		86 Flanagan Dr.
4. Stacy Rode		78 Flanagan Dr
5. IC ABRAMOV		36 Flanagan Dr
6. ANDREW KISS		4 Flanagan Dr.
7. Erin Malthie	Erin Malthie	49 Flanagan Dr
8. ANA ESPILA NAVARRO		18 Flanagan Dr
9. Stuart Rhein		29 Flanagan Dr.
10. Jennifer Goodhope		12 Sullivan Ter
11. Adrienne Donahue		3 Sullivan Ter.
12. HADI BAHATZI		4 Sullivan Ter

4. Please check each item below that applies to the referenced street(s):

✓ Pedestrian/Bicyclist Safety ✓ Speeding Vehicles ___ Sign placement

✓ High traffic volume ___ Parking Issues ✓ Difficult to cross street

✓ Sight Distance Issues (for drivers) ✓ Poor Road Conditions __ Other (describe):
* HILLS/NARROW ROAD

5. Required signatures. This form in the space provided below must contain signatures from at least ten (10) households or 50% of the residences or businesses on the street, whichever is less, for the town to begin consideration of a traffic calming plan. You can also obtain more signatures than the minimum to show local support for your request.

6. You may also attach a drawing on another sheet of paper if you think it will be helpful.

Please return this completed form to: Framingham Traffic & Roadway Safety Committee, c/o DPW – Engineering Division, 100 Western Avenue, Framingham, MA 01702

	Name	*Signature*	*Address*
1.	Alexander Barnett		83 Flanagan Dr.
2.	Wendy Arm		90 Flanagan Dr
3.	Andrew Pearlman		62 Flanagan Drive
4.	DEBRA YOUNG	Debra Young	43A Flanagan Drive
5.	Sandy Jagher	Sandy Jagher	41A Flanagan Drive
6.	LAURA YAGER		57 FLANAGAN DR
7.	Pamela Yunker		9 Sullivan Terrace
8.			
9.			
10.			
11.			
12.			

4. Please check each item below that applies to the referenced street(s):

✓ Pedestrian/Bicyclist Safety ✓ Speeding Vehicles ✓ Sign placement

✓ High traffic volume ___ Parking Issues ✓ Difficult to cross street

✓ Sight Distance Issues (for drivers) ✓ Poor Road Conditions __ Other (describe):

5. Required signatures. This form in the space provided below must contain signatures from at least ten (10) households or 50% of the residences or businesses on the street, whichever is less, for the town to begin consideration of a traffic calming plan. You can also obtain more signatures than the minimum to show local support for your request.

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Please return this completed form to: Framingham Traffic & Roadway Safety Committee, c/o DPW – Engineering Division, 100 Western Avenue, Framingham, MA 01702

Name	*Signature*	*Address*
1. Eileen Barrett		11 Flanagan
2. Steve Flannery		8 Vizve Circle
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		

4. Please check each item below that applies to the referenced street(s):

✓ Pedestrian/Bicyclist Safety ✓ Speeding Vehicles ✓ Sign placement

✓ High traffic volume ___ Parking Issues ✓ Difficult to cross street

✓ Sight Distance Issues (for drivers) ✓ Poor Road Conditions __ Other (describe):

5. Required signatures. This form in the space provided below must contain signatures from at least ten (10) households or 50% of the residences or businesses on the street, whichever is less, for the town to begin consideration of a traffic calming plan. You can also obtain more signatures than the minimum to show local support for your request.

6. You may also attach a drawing on another sheet of paper if you think it will be helpful.

Please return this completed form to: Framingham Traffic & Roadway Safety Committee, c/o DPW – Engineering Division, 100 Western Avenue, Framingham, MA 01702

Name	*Signature*	*Address*
1. Sarah + Chris Bernardi	Sarah Bernardi	9 Monterey Lane
2. Aeneas + Kimberly Mills		7 Monterey Lane
3. Anne Roseman	Anne Roseman	4 Monterey Lane
4. Zineb + Tim Curran	Zineb Curran	12 Monterey Lane
5. Lana Stone	Lana Stone	15 Gibbs Valley Path
6. Andrew Pollard		3 Monterey Ln
7. Jane Goldstein	Jane Goldstein	14 Monterey Ln
8.		
9.		
10.		
11.		
12.		

83 Flanagan Drive
Framingham, MA 01701

RE: Belknap Road - dangerous drivers

Belknap Road is an incredibly DANGEROUS street, especially when trying to enter onto this street from adjacent roads, but also when simply driving down the street at the posted speed – which very often results in having an impatient, above-speed driver right on your tail. I've had instances where I was doing the posted speed, only to have the driver behind me go into the oncoming lane – on the curvy Belknap Rd!!! – to pass me and endanger multiple lives.

When I pull out of Flanagan Drive, there will be absolutely no one coming to my left far up the hill, however, by the time I turn -- more often than not -- there is someone right on my tail -- obviously having gone WELL OVER the 25 mph speed limit over the crest of the hill. I've had individuals honk and make wild gestures at me when I am riding at the posted speed limit!!

Whenever a police officer substituted for our former crossing guard, s/he would comment to me that they were amazed at how FAST many drivers travel down Belknap -- right up until they saw the police officer standing there (and sometimes they did not slow down even then!!). And this is with a 20 mph school zone sign.

The speeding down Belknap Road needs to be dealt with. I request a traffic study and hope for resultant speed humps or other solution to this extremely pressing and dangerous problem.

Thank you very much for your consideration of my request.

Sincerely,

Sharon J.L. Barnett

10/26/15

Timothy and Zineb Curran
12 Monterey Lane
Framingham, MA 01701

Safety Officer Lt Robert Downing
Framingham Police Department
1 William Welch Way
Framingham, MA 01702

Dear Officer Downing,

With the recent (and necessary) paving of Belknap Road , we wanted to send you a note to highlight some heightened concerns with traffic/pedestrian safety on this heavily traveled, yet very residential, street.

We are very concerned that with the improved condition of this street, it will become even more susceptible to speeding, and thus magnify some of the concerning characteristics that were already in place on this street when cars had to begrudgingly slow for pot holes and crumbling pavement.

Speeding (now in a dysfunctional marriage with rampant cell phone use) on Belknap has always been concerning. Many use Belknap to avoid Rte 9, and they often drive as if they are traveling on Rte 9! Our family, including two young children, lives on Monterey Lane, just a few houses off of Belknap, and we use this street every day in some capacity. Pulling out onto Belknap in either direction is very dangerous, given the poor sight lines and fast moving traffic. Often, cars are driving significantly faster than the posted 25 mph (and not surprisingly looking at cell phones). When they turn a blind corner and look up from a text, there is no time to stop. It is even more risky walking on this street—amazingly, there are no sidewalks on Belknap, despite many residents using it for walking, biking, or jogging. We have had to completely abandon the prospect of walking on Belknap for less than a quarter mile to visit our friends because it is just too dangerous without sidewalks. Crossing over Belknap from Monterey to Major Hale Dr to access Callahan State Park requires that we hold our children tight, look both ways several times, and then sprint across! For those children living on Major Hale and attending Brophy School, we can't imagine there is any safe route—neither the dangerous crossing at Major Hale and Monterey in order to access the Gibbs Valley path to Brophy, nor walking down Belknap around the treacherous blind curve with no sidewalks to access the Flanagan drive crosswalk to Brophy. Furthermore, it seems there is no longer a crossing guard at the Flanagan Drive crosswalk to Brophy. Cars going too fast down the hill or uphill around a corner don't even have enough time to react if a child is crossing the street to get to school. There is a 20 mph school zone sign with lights, but it is somewhat obscured.

We recognize that there are many areas in Framingham in need of this kind of attention, and you probably receive numerous requests and/or complaints. However, given the volume of traffic on this road, the speed of traffic, and the dangerous combination of thickly settled residents and a school zone with no sidewalks and blind crossings, we are hoping you will explore options that might help mitigate these risks (or even divert those, who are dead-set on speeding, to other avenues)—things like further signage, another cross-walk between Monterey and Major Hale, the addition of sidewalks along Belknap, or speed humps? We know that many of the families in the area would greatly appreciate any time and attention you could devote to this matter, in the hope that we can all do our best to institute solutions that help prevent a needless tragedy in the future.

Thank you,

Timothy and Zineb Curran

Sarah and Chris Bernardi
9 Monterey Lane
Framingham, MA 01701
P) 508-877-0409

10/12/2015

Safety Officer Lt Robert Downing
Framingham Police Department
1 William Welch Way
Framingham, MA 01702

Dear Officer Downing,

Speeding on Belknap Rd has always been an issue. I am very concerned that it is going to get even worse given the current paving project going on. I live off of Monterey Lane and to pull out onto Belknap - taking a left up the hill or a right down the hill - is very dangerous and will get worse with freshly paved roads. More often than not cars are driving significantly faster than the posted 25 mph. It is even more risky walking down the street or even just crossing the street to walk up Major Hall Dr to the Callahan State Park entrance. And now there is no longer a crossing guard at the Flanagan Drive crosswalk going to Brophy School. Cars going too fast down the hill don't even have enough time to react if a child is crossing the street to get to school. There is a 20 mph school zone sign with lights but it is much too close to the cross walk and hidden behind some trees so I am sure many cars miss it. This is a very scary situation. I know there are a lot of streets in Framingham that need to be patrolled - but I am wondering if doing it for a few weeks - especially during rush hour times - might help the speeding and/or force people to not use Belknap as a cut through to Edgell Rd. Or possibly instituting some physical traffic calming measures like speed bumps or more signage/lights like I have seen popping up on some nearby roads such as Edmands and Millwood. I know I speak for many of the residents that live on and off Belknap that we would greatly appreciate any time and attention you could provide to this matter.

Thank you

Sarah and Chris Bernardi

Adam W. Kiel

From: Keith R. Strange
Sent: Friday, January 22, 2016 8:54 AM
To: Adam W. Kiel
Cc: Robert F. Downing
Subject: Fwd: Stealth Survey Belknap at Flanagan
Attachments: Scan-PDF-01222016.pdf; ATT00001.htm

Good morning Adam,

Here are the stealth survey results for the area you requested. The stealth was placed between Monterey Drive and Flanagan Drive to include the school zone and Pedestrian crosswalk signal. Any questions let me know.

Keith

Sent from my iPhone

Begin forwarded message:

> **From:** "Stephen H. Buma" <shb@framinghamma.gov>
> **Date:** January 22, 2016 at 8:51:02 AM EST
> **To:** "Robert F. Downing" <RFD@framinghamma.gov>, "Keith R. Strange" <KRS@framinghamma.gov>
> **Subject: Stealth Survey Belknap at Flanagan**
>
> See attached
>
> Belknap at Flanagan Drive Crosswalk (Inside School Zone)
> 25 MPH Speed Zone
> Stealth facing South
> MIN 15
> MAX 70
>
> Results
> Vehicles Surveyed: 4658
> Min 15
> Max 48
> Average 30.03
> 50% 31
> 85th 34
> Ten mile pace 26-35
>
> Stephen Buma
> Framingham Police Depatment
> 1 William Welch Way
> Framingham, MA 01702
> 508-872-1212 X 3307

STEALTH SURVEY INFO

<BELKNAP FLAN>
<>
POSTED SPEED LIMIT: <25>
SURVEY STARTED: <2016/01/21 10:05> FILENAME: 3B00047.DAT
MIN SPEED ALLOWED <15> MAX SPEED ALLOWED <70>

TOTAL VEHICLES = 4658 MINIMUM SPEED = 15 MAXIMUM SPEED = 48

AVERAGE SPEED = 30.03 50th PERCENTILE = 31 85th PERCENTILE = 34

TEN MILE PACE = 26 to 35

END OF REPORT

STEALTH SURVEY SUMMARY

<BELKNAP FLAN>
<>
POSTED SPEED LIMIT: <25>
SURVEY STARTED: <2016/01/21 10:05> FILENAME: 3B00047.DAT
MIN SPEED ALLOWED <15> MAX SPEED ALLOWED <70>

TIME	10:00	10:15	10:30	10:45	11:00	11:15	11:30	11:45	12:00	12:15	12:30	12:45	13:00	13:15	13:30	13:45	14:00	14:15
VEH.	0	72	114	112	99	70	66	61	46	48	49	50	47	44	49	57	42	49
AVG.	0.0	29.8	29.3	28.6	27.6	30.0	29.0	31.6	29.2	29.4	29.9	29.6	29.8	30.7	30.8	31.5	30.7	30.5

TIME	14:30	14:45	15:00	15:15	15:30	15:45	16:00	16:15	16:30	16:45	17:00	17:15	17:30	17:45	18:00	18:15	18:30	18:45
VEH.	55	58	57	59	40	60	69	73	57	82	88	89	74	107	113	95	108	107
AVG.	31.3	30.5	31.5	30.0	29.7	29.4	30.3	31.2	29.5	28.4	28.3	27.7	28.9	29.1	31.6	31.5	30.5	32.0

TIME	19:00	19:15	19:30	19:45	20:00	20:15	20:30	20:45	21:00	21:15	21:30	21:45	22:00	22:15	22:30	22:45	23:00	23:15
VEH.	107	118	107	93	121	68	95	65	65	68	56	42	46	54	34	30	27	24
AVG.	29.7	29.8	30.0	31.1	30.4	30.7	30.2	29.9	30.9	30.2	30.5	31.0	29.5	30.0	30.5	31.0	30.5	31.3

TIME	23:30	23:45	00:00	00:15	00:30	00:45	01:00	01:15	01:30	01:45	02:00	02:15	02:30	02:45	03:00	03:15	03:30	03:45
VEH.	27	25	19	18	14	10	6	4	5	11	8	7	4	4	2	5	2	1
AVG.	29.0	29.4	29.5	33.7	29.9	31.8	31.2	31.8	32.2	32.5	30.5	29.3	34.0	31.8	31.0	33.0	32.5	24.0

TIME	04:00	04:15	04:30	04:45	05:00	05:15	05:30	05:45	06:00	06:15	06:30	06:45	07:00	07:15	07:30	07:45	08:00	08:15
VEH.	0	0	0	0	3	0	4	3	2	1	4	7	5	8	13	17	34	39
AVG.	0.0	0.0	0.0	0.0	33.3	0.0	22.8	29.7	35.0	37.0	29.0	34.6	30.8	31.9	30.2	32.1	30.2	30.5

TIME	08:30	08:45	09:00	09:15	09:30	09:45	10:00	10:15
VEH.	52	89	91	87	100	109	115	17
AVG.	28.4	30.2	31.0	28.9	31.4	30.0	28.3	23.6

TOTAL VEHICLES = 4658 MINIMUM SPEED = 15 MAXIMUM SPEED = 48

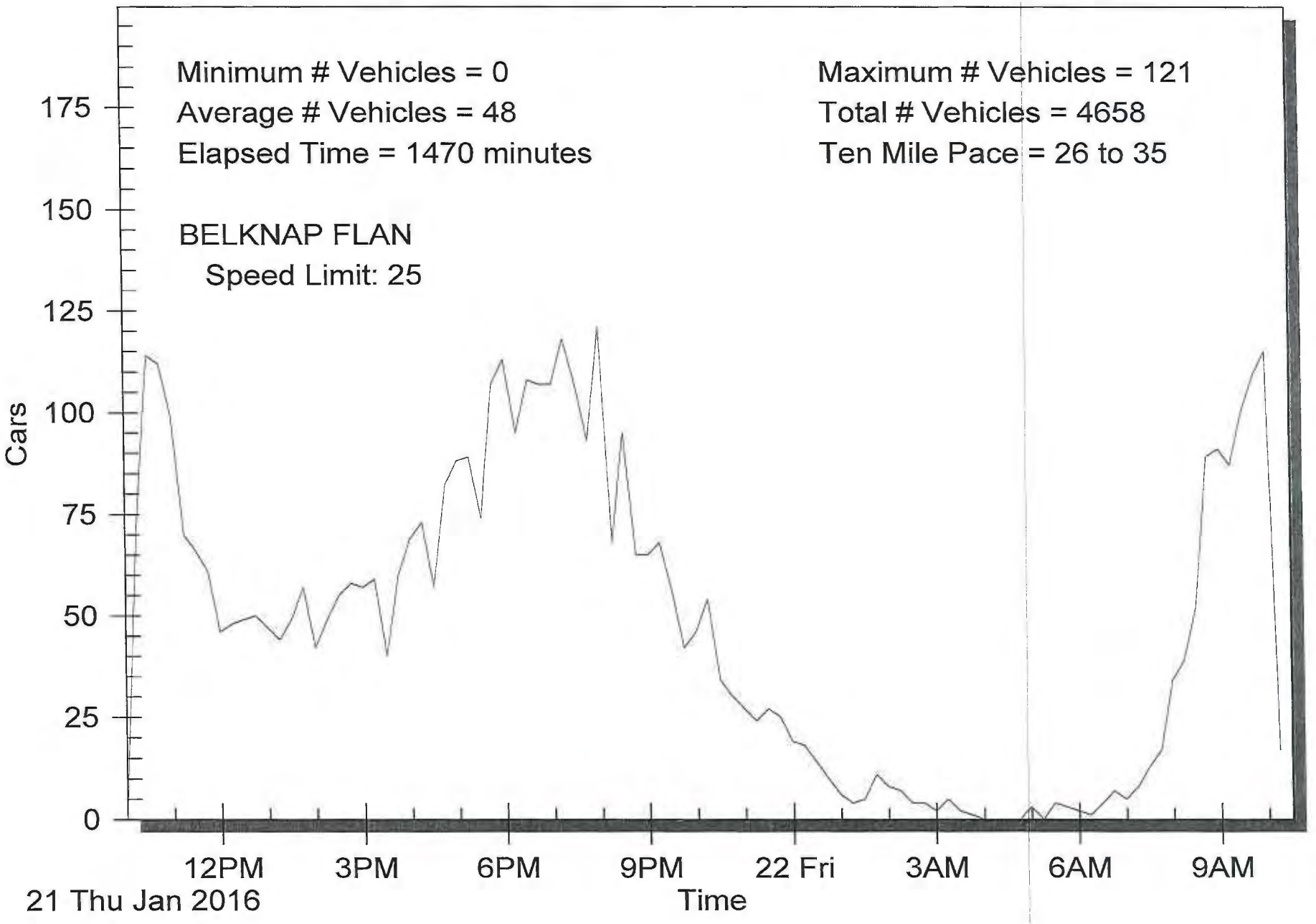
AVERAGE SPEED = 30.03 50th PERCENTILE = 31 85th PERCENTILE = 34

TEN MILE PACE = 26 to 35

END OF REPORT

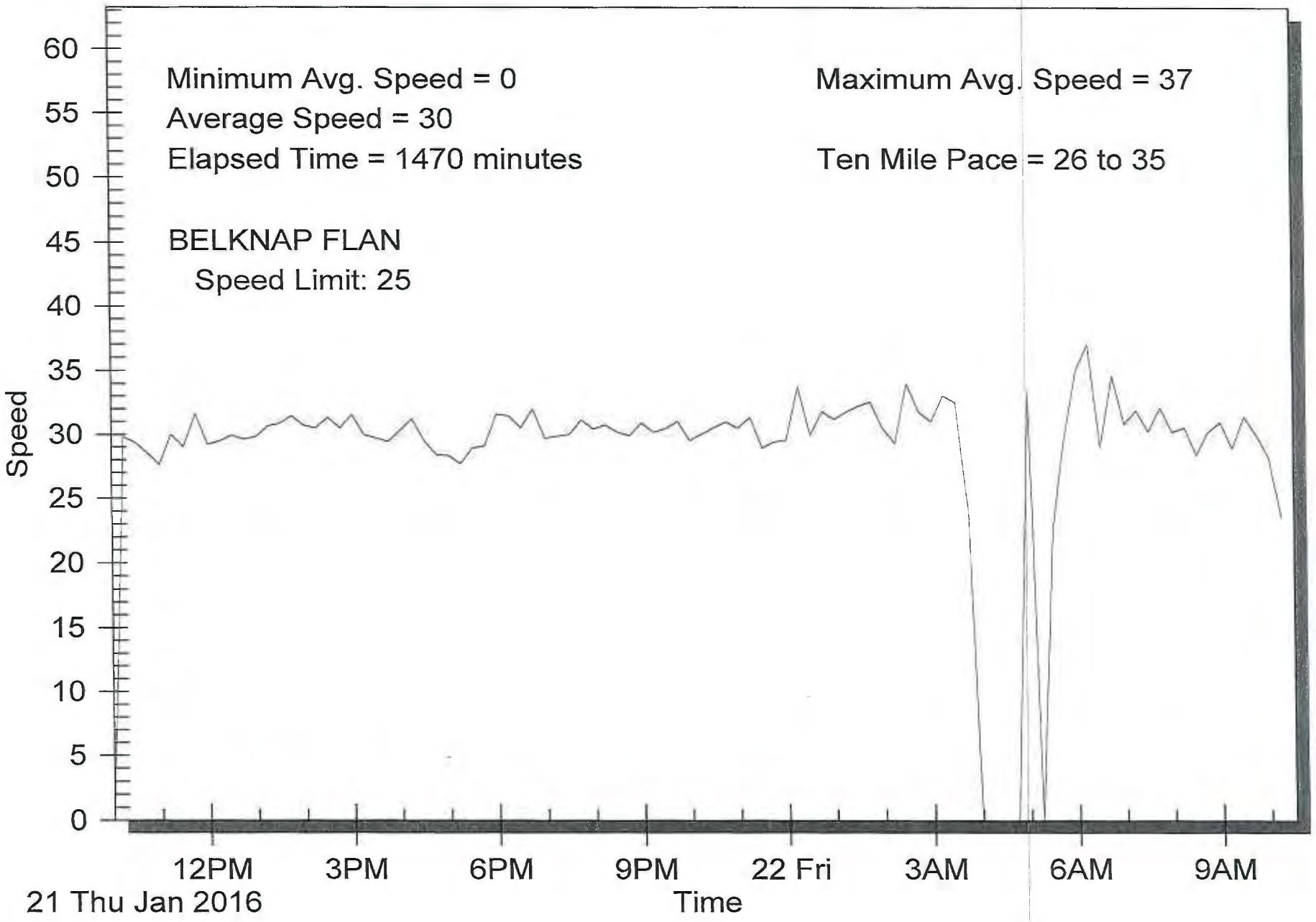
Cars vs. Time

FILENAME: <3B00047.DAT>



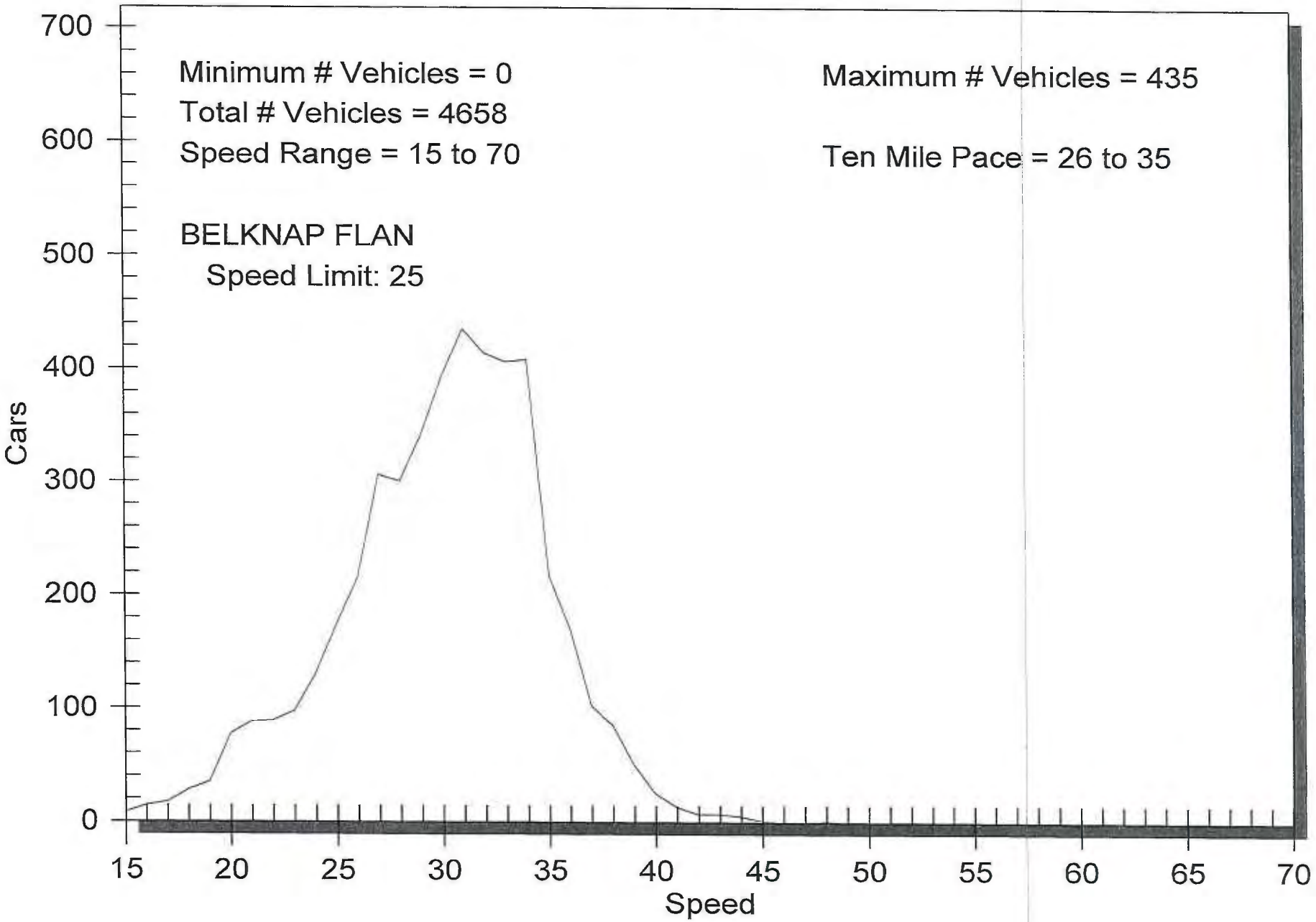
Speed vs. Time

FILENAME: <3B00047.DAT>



Cars vs. Speed

FILENAME: <3B00047.DAT>



B. SPEED ZONE REGULATIONS

Rogers, Nicole

From: Adam W. Kiel <awk@framinghamma.gov>
Sent: Friday, April 01, 2016 3:10 PM
To: Noyes, James
Cc: Rogers, Nicole
Subject: RE: Belknap Road
Attachments: 02 10 2016 TRSC Minutes.pdf; 02-10-2016 TRSC (partial) Backup.pdf

25MPH entire length both directions, 1.76 miles from Pleasant Street to Edgell Road according to Town of Framingham Special Speed Regulation No. 5053 dated June 15, 1979

Adam W. Kiel, P.E.
Senior Traffic and Transportation Engineer

Town of Framingham
Department of Public Works
100 Western Avenue
Framingham, Massachusetts 01702

Phone: (508) 532-6010
Fax: (508) 424-3428
Email: awk@FraminghamMA.gov

From: Noyes, James [mailto:jnoyes@gpinet.com]
Sent: Friday, April 01, 2016 2:53 PM
To: Adam W. Kiel <awk@framinghamma.gov>
Cc: Rogers, Nicole <nrogers@gpinet.com>
Subject: Belknap Road

Hi Adam, when you have a chance, could you forward any info that you have on Belknap Road (TRSC meeting info and minutes), as well as any speed regulations?

I hoping that you haven't already sent them to me, as I can't find anything here. If you did, I apologize for having to ask you for it again.

Jim

GPI

James R. Noyes
978.570.2999 | d 978.570.2972 | c 774.218.2076
An Equal Opportunity Employer

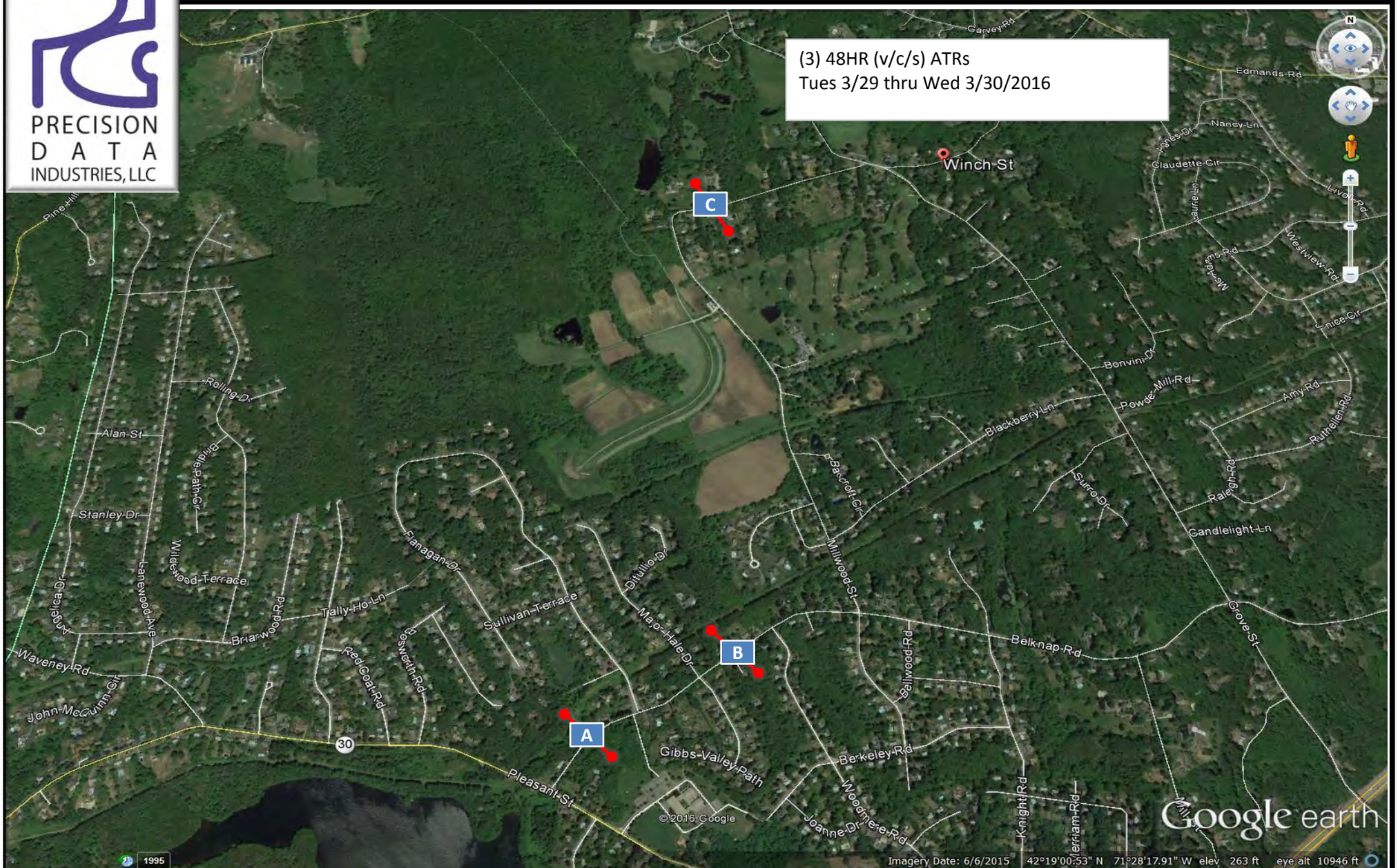
From: Noyes, James
Sent: Monday, March 14, 2016 2:31 PM
To: Adam W. Kiel <awk@framinghamma.gov>
Subject: RE: PO Closeouts

Hi Adam, I meant to thank you for sending the info for Belknap. I received the signed LOU this morning, and we're starting to work on it.

When you have a chance, can you send me any info that you have (i.e. materials from the TRSC meeting, and minutes). Also, any speed regulations on that roadway.

C. TRAFFIC VOLUME AND SPEED DATA

Location Map: 165016 Framingham, MA



Client:	Engineer:	Site Code:	Date:	PDI Job #	City, State:
Greenman-Pedersen	N. Rogers	MAX-2015047.05	Tues 3/29 thru Wed 3/30/2016	165016	Framingham, MA

Belknap Road
west of Pleasant Street (Route 30)
City, State: Framingham, MA
Client: GPI/ N. Rogers

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

165016 A CLASS
Site Code: TBA
Date Start: 29-Mar-16

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/29/1														
6	0	3	0	0	0	0	0	0	0	0	0	0	0	3
01:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
04:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1
05:00	0	12	0	0	0	0	0	0	0	0	0	0	0	12
06:00	0	68	6	2	3	1	0	0	0	0	0	0	0	80
07:00	0	168	27	4	3	0	0	2	0	0	0	0	0	204
08:00	0	126	27	2	5	1	0	1	0	0	0	0	0	162
09:00	0	87	25	0	0	0	0	0	0	0	0	0	0	112
10:00	0	67	9	0	2	0	0	0	0	0	0	0	0	78
11:00	0	69	15	0	2	0	0	0	0	0	0	0	0	86
12 PM	0	72	12	0	2	0	0	1	0	0	0	0	0	87
13:00	0	57	12	1	4	0	0	0	0	0	0	0	0	74
14:00	0	81	30	2	5	0	0	0	0	0	0	0	0	118
15:00	64	79	1	1	1	0	0	0	0	0	0	0	0	146
16:00	4	180	20	0	2	0	0	0	0	0	0	0	0	206
17:00	6	219	15	0	0	0	0	1	0	0	0	0	0	241
18:00	0	150	14	0	2	0	0	0	0	0	0	0	0	166
19:00	0	102	9	0	2	0	0	0	0	0	0	0	0	113
20:00	1	59	4	0	0	0	0	0	0	0	0	0	0	64
21:00	0	38	1	0	0	0	0	0	0	0	0	0	0	39
22:00	0	16	1	0	0	0	0	0	0	0	0	0	0	17
23:00	0	11	1	0	0	0	0	0	0	0	0	0	0	12
Total	75	1669	231	12	33	2	0	5	0	0	0	0	0	2027
Percent	3.7%	82.3%	11.4%	0.6%	1.6%	0.1%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak		07:00	07:00	07:00	08:00	06:00		07:00						07:00
Vol.		168	27	4	5	1		2						204
PM Peak	15:00	17:00	14:00	14:00	14:00			12:00						17:00
Vol.	64	219	30	2	5			1						241

Belknap Road
west of Pleasant Street (Route 30)
City, State: Framingham, MA
Client: GPI/ N. Rogers

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

165016 A CLASS
Site Code: TBA
Date Start: 29-Mar-16

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/30/1														
6	0	1	1	0	0	0	0	0	0	0	0	0	0	2
01:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
05:00	1	9	1	0	1	0	0	0	0	0	0	0	0	12
06:00	1	66	11	3	1	0	0	1	0	0	0	0	0	83
07:00	7	171	13	1	8	1	0	1	0	0	0	0	0	202
08:00	2	118	22	1	3	0	0	1	0	0	0	0	0	147
09:00	2	65	18	0	3	0	0	1	0	0	0	0	0	89
10:00	1	46	11	1	2	0	0	0	0	0	0	0	0	61
11:00	3	68	15	0	5	0	0	0	0	0	0	0	0	91
12 PM	0	68	17	0	5	0	0	0	0	0	0	0	0	90
13:00	4	55	17	1	6	0	0	0	0	0	0	0	0	83
14:00	2	88	13	1	6	1	0	0	0	0	0	0	0	111
15:00	6	96	37	1	7	0	0	0	0	0	0	0	0	147
16:00	5	100	54	0	7	0	0	0	0	0	0	0	0	166
17:00	17	159	59	1	1	0	0	0	0	0	0	0	0	237
18:00	4	134	24	0	6	0	0	1	0	0	0	0	0	169
19:00	0	76	20	0	4	0	0	0	0	0	0	0	0	100
20:00	0	51	10	0	0	0	0	0	0	0	0	0	0	61
21:00	0	40	13	0	1	0	0	0	0	0	0	0	0	54
22:00	1	20	3	0	1	0	0	0	0	0	0	0	0	25
23:00	0	10	0	0	0	0	0	0	0	0	0	0	0	10
Total	56	1444	360	10	67	2	0	5	0	0	0	0	0	1944
Percent	2.9%	74.3%	18.5%	0.5%	3.4%	0.1%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	08:00	06:00	07:00	07:00		06:00						07:00
Vol.	7	171	22	3	8	1		1						202
PM Peak	17:00	17:00	17:00	13:00	15:00	14:00		18:00						17:00
Vol.	17	159	59	1	7	1		1						237
Total		3113	591	22	100	4	0	10	0	0	0	0	0	3971

Belknap Road
west of Pleasant Street (Route 30)
City, State: Framingham, MA
Client: GPI/ N. Rogers

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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165016 A CLASS
Site Code: TBA
Date Start: 29-Mar-16

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/29/1														
6	0	2	0	0	0	0	0	0	0	0	0	0	0	2
01:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
04:00	0	10	0	0	1	0	0	0	0	0	0	0	0	11
05:00	0	21	5	0	0	0	0	0	0	0	0	0	0	26
06:00	0	84	11	1	3	0	0	0	0	0	0	0	0	99
07:00	0	197	24	3	1	0	0	0	0	0	0	0	0	225
08:00	0	260	26	2	2	0	0	0	0	0	0	0	0	290
09:00	0	146	14	0	3	1	0	0	0	0	0	0	0	164
10:00	0	80	13	0	8	0	0	0	0	0	0	0	0	101
11:00	0	79	8	0	4	0	0	3	0	0	0	0	0	94
12 PM	1	91	14	0	1	0	0	0	0	0	0	0	0	107
13:00	0	92	11	1	6	1	0	1	0	0	0	0	0	112
14:00	0	103	17	7	5	0	0	1	0	0	0	0	0	133
15:00	0	186	34	2	8	1	0	0	0	0	0	0	0	231
16:00	0	160	34	0	9	0	0	0	0	0	0	0	0	203
17:00	1	176	37	1	8	0	0	0	0	0	0	0	0	223
18:00	0	145	24	0	7	0	0	0	0	0	0	0	0	176
19:00	0	60	20	0	7	0	0	0	0	0	0	0	0	87
20:00	0	29	13	0	2	0	0	0	0	0	0	0	0	44
21:00	0	10	5	0	3	0	0	0	0	0	0	0	0	18
22:00	0	10	6	0	0	0	0	0	0	0	0	0	0	16
23:00	0	4	3	0	1	0	0	0	0	0	0	0	0	8
Total	2	1950	319	17	79	3	0	5	0	0	0	0	0	2375
Percent	0.1%	82.1%	13.4%	0.7%	3.3%	0.1%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak		08:00	08:00	07:00	10:00	09:00		11:00						08:00
Vol.		260	26	3	8	1		3						290
PM Peak	12:00	15:00	17:00	14:00	16:00	13:00		13:00						15:00
Vol.	1	186	37	7	9	1		1						231

Belknap Road
west of Pleasant Street (Route 30)
City, State: Framingham, MA
Client: GPI/ N. Rogers

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

165016 A CLASS
Site Code: TBA
Date Start: 29-Mar-16

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/30/1														
6	0	1	2	0	0	0	0	0	0	0	0	0	0	3
01:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
04:00	0	4	3	0	0	0	0	0	0	0	0	0	0	7
05:00	0	12	17	0	0	0	0	0	0	0	0	0	0	29
06:00	0	45	41	1	13	0	0	0	0	0	0	0	0	100
07:00	0	150	61	0	12	0	0	1	0	0	0	0	0	224
08:00	0	183	67	2	11	0	0	1	0	0	0	0	0	264
09:00	0	106	56	1	10	0	0	0	0	0	0	0	0	173
10:00	0	53	20	0	12	0	0	0	0	0	0	0	0	85
11:00	0	63	40	0	12	0	0	1	0	0	0	0	0	116
12 PM	2	48	29	0	9	0	0	0	0	0	0	0	0	88
13:00	0	51	34	1	6	1	0	2	0	0	0	0	0	95
14:00	2	74	46	5	8	1	0	2	0	0	0	0	0	138
15:00	1	132	74	3	17	1	0	2	0	0	0	0	0	230
16:00	0	129	76	0	16	0	0	0	0	0	0	0	0	221
17:00	0	128	74	0	22	0	0	0	0	0	0	0	0	224
18:00	0	105	54	0	11	0	0	0	0	0	0	0	0	170
19:00	0	40	29	0	9	0	0	0	0	0	0	0	0	78
20:00	0	27	20	0	3	0	0	0	0	0	0	0	0	50
21:00	0	11	19	0	2	0	0	0	0	0	0	0	0	32
22:00	0	3	9	0	0	0	0	0	0	0	0	0	0	12
23:00	0	3	3	0	1	0	0	0	0	0	0	0	0	7
Total	5	1370	775	13	174	3	0	9	0	0	0	0	0	2349
Percent	0.2%	58.3%	33.0%	0.6%	7.4%	0.1%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak		08:00	08:00	08:00	06:00			07:00						08:00
Vol.		183	67	2	13			1						264
PM Peak	12:00	15:00	16:00	14:00	17:00	13:00		13:00						15:00
Vol.	2	132	76	5	22	1		2						230
Total		3320	1094	30	253	6	0	14	0	0	0	0	0	4724

Belknap Road
west of Pleasant Street (Route 30)
City, State: Framingham, MA
Client: GPI/ N. Rogers

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165016 A SPEED
Site Code: TBA
Date Start: 29-Mar-16

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
03/29/ 16	0	0	0	1	1	1	0	0	0	0	0	0	0	3	36	32
01:00	0	0	0	2	1	1	0	0	0	0	0	0	0	4	36	31
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	1	0	1	0	0	0	0	0	0	0	0	0	2	27	22
04:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1	33	32
05:00	0	0	0	4	5	3	0	0	0	0	0	0	0	12	36	32
06:00	**1**	1	4	14	40	19	1	0	0	0	0	0	0	80	36	31
07:00	0	0	3	53	**109**	**35**	**4**	0	0	0	0	0	0	**204**	35	32
08:00	1	**2**	**20**	**68**	56	15	0	0	0	0	0	0	0	162	33	29
09:00	0	1	8	26	53	23	1	0	0	0	0	0	0	112	35	31
10:00	0	1	2	19	42	13	1	0	0	0	0	0	0	78	34	31
11:00	0	0	1	21	44	18	2	0	0	0	0	0	0	86	35	32
12 PM	0	0	2	23	42	18	2	0	0	0	0	0	0	87	35	32
13:00	0	0	0	15	44	14	1	0	0	0	0	0	0	74	35	32
14:00	0	**2**	**5**	**29**	**52**	**21**	**8**	**1**	0	0	0	0	0	**118**	36	32
15:00	**8**	**42**	**70**	23	3	0	0	0	0	0	0	0	0	146	24	21
16:00	2	1	15	82	89	17	0	0	0	0	0	0	0	206	33	29
17:00	0	1	12	**88**	**115**	24	**1**	0	0	0	0	0	0	**241**	33	30
18:00	0	0	8	58	71	**28**	1	0	0	0	0	0	0	166	34	31
19:00	0	1	11	47	47	7	0	0	0	0	0	0	0	113	32	29
20:00	0	1	1	32	26	4	0	0	0	0	0	0	0	64	32	29
21:00	0	2	6	11	18	2	0	0	0	0	0	0	0	39	32	29
22:00	0	0	2	3	11	1	0	0	0	0	0	0	0	17	33	30
23:00	0	0	0	6	4	2	0	0	0	0	0	0	0	12	34	30
Total	12	56	170	626	874	266	22	1	0	0	0	0	0	2027		
%	0.6%	2.8%	8.4%	30.9%	43.1%	13.1%	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	06:00	08:00	08:00	08:00	07:00	07:00	07:00							07:00		
Vol.	1	2	20	68	109	35	4							204		
Midday Peak		14:00	14:00	14:00	14:00	14:00	14:00	14:00						14:00		
Vol.		2	5	29	52	21	8	1						118		
PM Peak	15:00	15:00	15:00	17:00	17:00	18:00	17:00							17:00		
Vol.	8	42	70	88	115	28	1							241		

% iles	
15th Percentile :	24 MPH
50th Percentile :	29 MPH
85th Percentile :	33 MPH
95th Percentile :	37 MPH

Stats	
10 MPH Pace Speed :	25-34 MPH
Number in Pace :	1500
Percent in Pace :	74.0%
Number of Vehicles > 25 MPH :	1664
Percent of Vehicles > 25 MPH :	82.1%
Mean Speed(Average) :	30 MPH

PRECISION
D A T A
INDUSTRIES, LLC
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Belknap Road
west of Pleasant Street (Route 30)
City, State: Framingham, MA
Client: GPI/ N. Rogers

165016 A SPEED
Site Code: TBA
Date Start: 29-Mar-16

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
03/30/ 16	0	0	0	0	1	1	0	0	0	0	0	0	0	2	37	35
01:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1	33	32
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1	28	27
04:00	0	0	1	0	1	0	0	0	0	0	0	0	0	2	32	27
05:00	0	0	2	5	3	2	0	0	0	0	0	0	0	12	34	29
06:00	**1**	**4**	6	14	39	18	1	0	0	0	0	0	0	83	35	31
07:00	0	1	16	44	**96**	**43**	**2**	0	0	0	0	0	0	**202**	35	31
08:00	0	3	**18**	**54**	56	14	2	0	0	0	0	0	0	147	33	29
09:00	0	3	14	32	33	7	0	0	0	0	0	0	0	89	33	29
10:00	0	0	2	14	28	14	3	0	0	0	0	0	0	61	36	32
11:00	0	**3**	8	21	32	24	3	0	0	0	0	0	0	91	36	31
12 PM	0	0	3	13	35	**33**	6	0	0	0	0	0	0	90	37	33
13:00	0	0	6	18	33	18	**8**	0	0	0	0	0	0	83	37	32
14:00	0	2	**11**	**37**	**43**	16	2	0	0	0	0	0	0	**111**	34	30
15:00	0	1	**23**	**47**	57	14	5	0	0	0	0	0	0	147	33	30
16:00	0	1	6	35	60	52	10	**2**	0	0	0	0	0	166	37	33
17:00	**2**	**4**	12	47	**93**	**59**	**18**	2	0	0	0	0	0	**237**	37	32
18:00	0	1	3	43	69	41	10	2	0	0	0	0	0	169	37	32
19:00	0	2	3	24	46	20	5	0	0	0	0	0	0	100	36	32
20:00	0	0	4	12	21	16	8	0	0	0	0	0	0	61	38	33
21:00	0	0	3	16	21	12	2	0	0	0	0	0	0	54	36	31
22:00	0	0	1	4	11	6	3	0	0	0	0	0	0	25	38	33
23:00	0	1	0	3	4	1	1	0	0	0	0	0	0	10	36	31
Total	3	26	142	484	783	411	89	6	0	0	0	0	0	1944		
%	0.2%	1.3%	7.3%	24.9%	40.3%	21.1%	4.6%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	06:00	06:00	08:00	08:00	07:00	07:00	07:00							07:00		
Vol.	1	4	18	54	96	43	2							202		
Midday Peak		11:00	14:00	14:00	14:00	12:00	13:00							14:00		
Vol.		3	11	37	43	33	8							111		
PM Peak	17:00	17:00	15:00	15:00	17:00	17:00	17:00	16:00						17:00		
Vol.	2	4	23	47	93	59	18	2						237		

% iles		
15th Percentile :	25	MPH
50th Percentile :	31	MPH
85th Percentile :	36	MPH
95th Percentile :	38	MPH

Stats		
10 MPH Pace Speed :	25-34	MPH
Number in Pace :	1267	
Percent in Pace :	65.2%	
Number of Vehicles > 25 MPH :	1676	
Percent of Vehicles > 25 MPH :	86.2%	
Mean Speed(Average) :	31	MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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Belknap Road
west of Pleasant Street (Route 30)
City, State: Framingham, MA
Client: GPI/ N. Rogers

165016 A SPEED
Site Code: TBA
Date Start: 29-Mar-16

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
03/29/ 16	0	0	0	0	2	0	0	0	0	0	0	0	0	2	33	32
01:00	0	0	0	0	2	0	0	0	0	0	0	0	0	2	33	32
02:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1	28	27
03:00	0	0	1	0	1	0	0	0	0	0	0	0	0	2	32	27
04:00	0	0	0	3	5	3	0	0	0	0	0	0	0	11	36	32
05:00	0	0	1	11	6	7	1	0	0	0	0	0	0	26	36	31
06:00	0	**1**	9	18	59	11	1	0	0	0	0	0	0	99	33	31
07:00	0	0	14	70	120	21	0	0	0	0	0	0	0	225	33	30
08:00	0	1	**21**	**91**	**145**	**28**	**3**	**1**	0	0	0	0	0	**290**	33	30
09:00	0	0	7	34	99	21	3	0	0	0	0	0	0	164	33	31
10:00	0	0	1	14	63	19	4	0	0	0	0	0	0	101	36	33
11:00	0	0	2	27	46	17	**2**	0	0	0	0	0	0	94	35	31
12 PM	0	0	1	23	52	**29**	1	**1**	0	0	0	0	0	107	36	32
13:00	0	**1**	2	19	61	29	0	0	0	0	0	0	0	112	36	32
14:00	0	1	**5**	**42**	**65**	18	2	0	0	0	0	0	0	**133**	34	31
15:00	0	**2**	**13**	**57**	**105**	45	7	2	0	0	0	0	0	**231**	36	31
16:00	0	0	1	13	91	**87**	8	3	0	0	0	0	0	203	37	34
17:00	0	0	2	20	89	84	18	3	**4**	**3**	0	0	0	223	38	35
18:00	0	0	0	15	64	70	**22**	**4**	1	0	0	0	0	176	39	35
19:00	0	0	0	14	35	30	8	0	0	0	0	0	0	87	38	34
20:00	0	0	0	1	16	20	7	0	0	0	0	0	0	44	39	36
21:00	0	0	0	0	3	8	4	3	0	0	0	0	0	18	44	39
22:00	0	0	0	0	2	8	6	0	0	0	0	0	0	16	42	38
23:00	0	0	0	1	1	2	3	1	0	0	0	0	0	8	43	38
Total	0	6	80	474	1132	557	100	18	5	3	0	0	0	2375		
%	0.0%	0.3%	3.4%	20.0%	47.7%	23.5%	4.2%	0.8%	0.2%	0.1%	0.0%	0.0%	0.0%			
AM Peak		06:00	08:00	08:00	08:00	08:00	08:00	08:00						08:00		
Vol.		1	21	91	145	28	3	1						290		
Midday Peak		13:00	14:00	14:00	14:00	12:00	11:00	12:00						14:00		
Vol.		1	5	42	65	29	2	1						133		
PM Peak		15:00	15:00	15:00	15:00	16:00	18:00	18:00	17:00	17:00				15:00		
Vol.		2	13	57	105	87	22	4	4	3				231		

% iles	
15th Percentile :	26 MPH
50th Percentile :	31 MPH
85th Percentile :	36 MPH
95th Percentile :	39 MPH

Stats	
10 MPH Pace Speed :	30-39 MPH
Number in Pace :	1689
Percent in Pace :	71.1%
Number of Vehicles > 25 MPH :	2194
Percent of Vehicles > 25 MPH :	92.4%
Mean Speed(Average) :	32 MPH

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Belknap Road
west of Pleasant Street (Route 30)
City, State: Framingham, MA
Client: GPI/ N. Rogers

165016 A SPEED
Site Code: TBA
Date Start: 29-Mar-16

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
03/30/ 16	0	0	0	0	0	1	2	0	0	0	0	0	0	3	42	40
01:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1	33	32
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	1	1	0	0	0	0	0	2	47	45
04:00	0	0	0	0	3	1	2	0	**1**	0	0	0	0	7	43	38
05:00	0	0	0	1	12	7	8	0	0	1	0	0	0	29	41	37
06:00	0	0	3	9	31	46	9	0	1	1	0	0	0	100	38	35
07:00	0	0	8	25	66	94	20	**4**	1	**6**	0	0	0	224	38	35
08:00	0	**2**	**15**	**32**	**88**	**100**	**23**	4	0	0	0	0	0	**264**	38	34
09:00	0	0	2	27	55	62	22	4	1	0	0	0	0	173	39	35
10:00	0	1	1	3	19	32	21	7	1	0	0	0	0	85	42	37
11:00	0	0	0	8	33	**46**	**24**	**4**	**1**	0	0	0	0	116	41	36
12 PM	0	0	0	1	25	39	20	3	0	0	0	0	0	88	41	37
13:00	0	0	1	7	33	38	13	2	1	0	0	0	0	95	39	35
14:00	0	**2**	**7**	**25**	**40**	40	14	3	1	**5**	**1**	0	0	**138**	40	34
15:00	0	0	**4**	**41**	64	84	23	**8**	**6**	0	0	0	0	**230**	39	35
16:00	0	0	2	15	65	**100**	30	3	4	**2**	0	0	0	221	39	36
17:00	0	0	0	10	**81**	93	**32**	4	4	0	0	0	0	224	40	36
18:00	0	0	0	2	49	78	28	8	4	1	0	0	0	170	41	37
19:00	0	0	0	7	22	33	12	4	0	0	0	0	0	78	40	36
20:00	0	0	1	0	10	23	9	7	0	0	0	0	0	50	43	38
21:00	0	0	0	0	12	11	5	3	1	0	0	0	0	32	43	37
22:00	0	0	0	0	1	2	7	1	1	0	0	0	0	12	44	42
23:00	0	0	0	0	0	3	4	0	0	0	0	0	0	7	42	40
Total	0	5	44	213	710	933	329	70	28	16	1	0	0	2349		
%	0.0%	0.2%	1.9%	9.1%	30.2%	39.7%	14.0%	3.0%	1.2%	0.7%	0.0%	0.0%	0.0%			
AM Peak		08:00	08:00	08:00	08:00	08:00	08:00	07:00	04:00	07:00				08:00		
Vol.		2	15	32	88	100	23	4	1	6				264		
Midday Peak		14:00	14:00	14:00	14:00	11:00	11:00	11:00	11:00	14:00	14:00			14:00		
Vol.		2	7	25	40	46	24	4	1	5	1			138		
PM Peak			15:00	15:00	17:00	16:00	17:00	15:00	15:00	16:00				15:00		
Vol.			4	41	81	100	32	8	6	2				230		

% iles	15th Percentile :	29 MPH
	50th Percentile :	35 MPH
	85th Percentile :	40 MPH
	95th Percentile :	43 MPH

Stats	10 MPH Pace Speed :	30-39 MPH
	Number in Pace :	1643
	Percent in Pace :	69.9%
	Number of Vehicles > 25 MPH :	2257
	Percent of Vehicles > 25 MPH :	96.1%
	Mean Speed(Average) :	36 MPH

Belknap Road
west of Pleasant Street (Route 30)
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Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

165016 A VOLUME
Site Code: TBA
Date Start: 29-Mar-16

Start	EB				WB				Combined				29-Mar-16
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	2		26		2		20		4		46		
12:15	0		23		0		22		0		45		
12:30	0		24		0		30		0		54		
12:45	1	3	14	87	0	2	35	107	1	5	49	194	
01:00	1		25		0		28		1		53		
01:15	0		16		1		26		1		42		
01:30	0		19		1		20		1		39		
01:45	3	4	14	74	0	2	38	112	3	6	52	186	
02:00	0		24		0		29		0		53		
02:15	0		31		0		31		0		62		
02:30	0		26		1		35		1		61		
02:45	0	0	37	118	0	1	38	133	0	1	75	251	
03:00	1		35		1		53		2		88		
03:15	0		40		0		60		0		100		
03:30	1		27		0		60		1		87		
03:45	0	2	44	146	1	2	58	231	1	4	102	377	
04:00	0		45		1		44		1		89		
04:15	0		52		2		61		2		113		
04:30	0		58		3		55		3		113		
04:45	1	1	51	206	5	11	43	203	6	12	94	409	
05:00	0		55		5		51		5		106		
05:15	1		65		7		55		8		120		
05:30	7		54		1		56		8		110		
05:45	4	12	67	241	13	26	61	223	17	38	128	464	
06:00	8		50		14		54		22		104		
06:15	11		36		18		42		29		78		
06:30	28		41		33		45		61		86		
06:45	33	80	39	166	34	99	35	176	67	179	74	342	
07:00	37		34		45		23		82		57		
07:15	58		32		41		31		99		63		
07:30	57		19		74		20		131		39		
07:45	52	204	28	113	65	225	13	87	117	429	41	200	
08:00	40		25		74		12		114		37		
08:15	31		20		90		6		121		26		
08:30	46		8		62		10		108		18		
08:45	45	162	11	64	64	290	16	44	109	452	27	108	
09:00	42		10		54		6		96		16		
09:15	21		14		44		7		65		21		
09:30	29		7		36		3		65		10		
09:45	20	112	8	39	30	164	2	18	50	276	10	57	
10:00	20		4		34		6		54		10		
10:15	18		2		23		4		41		6		
10:30	21		8		18		4		39		12		
10:45	19	78	3	17	26	101	2	16	45	179	5	33	
11:00	22		4		26		2		48		6		
11:15	16		4		24		4		40		8		
11:30	28		0		21		2		49		2		
11:45	20	86	4	12	23	94	0	8	43	180	4	20	
Total	744		1283		1017		1358		1761		2641		
Percent	42.2%		48.6%		57.8%		51.4%						
Day Total		2027				2375				4402			
Peak	07:15	-	05:00	-	07:30	-	03:00	-	07:30	-	05:00	-	-	-
Vol.	207	-	241	-	303	-	231	-	483	-	464	-	-	-
P.H.F.	0.892		0.899		0.842		0.963		0.922		0.906			

Belknap Road
west of Pleasant Street (Route 30)
City, State: Framingham, MA
Client: GPI/ N. Rogers

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

165016 A VOLUME
Site Code: TBA
Date Start: 29-Mar-16

Start	EB				WB				Combined				30-Mar-16
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	0		19		2		19		2		38		
12:15	1		28		0		21		1		49		
12:30	0		23		0		21		0		44		
12:45	1	2	20	90	1	3	27	88	2	5	47	178	
01:00	0		22		0		26		0		48		
01:15	0		21		0		23		0		44		
01:30	1		22		0		25		1		47		
01:45	0	1	18	83	1	1	21	95	1	2	39	178	
02:00	0		27		0		35		0		62		
02:15	0		27		0		22		0		49		
02:30	0		25		0		34		0		59		
02:45	0	0	32	111	0	0	47	138	0	0	79	249	
03:00	0		31		0		54		0		85		
03:15	0		42		0		57		0		99		
03:30	0		29		2		62		2		91		
03:45	1	1	45	147	0	2	57	230	1	3	102	377	
04:00	0		46		1		62		1		108		
04:15	0		37		2		66		2		103		
04:30	0		36		2		50		2		86		
04:45	2	2	47	166	2	7	43	221	4	9	90	387	
05:00	0		49		6		53		6		102		
05:15	1		64		5		52		6		116		
05:30	5		58		7		62		12		120		
05:45	6	12	66	237	11	29	57	224	17	41	123	461	
06:00	7		48		13		56		20		104		
06:15	11		46		19		43		30		89		
06:30	24		34		32		33		56		67		
06:45	41	83	41	169	36	100	38	170	77	183	79	339	
07:00	44		26		42		19		86		45		
07:15	58		32		41		21		99		53		
07:30	52		22		65		25		117		47		
07:45	48	202	20	100	76	224	13	78	124	426	33	178	
08:00	35		15		65		14		100		29		
08:15	36		21		86		9		122		30		
08:30	41		12		58		16		99		28		
08:45	35	147	13	61	55	264	11	50	90	411	24	111	
09:00	27		11		66		16		93		27		
09:15	28		14		47		7		75		21		
09:30	16		16		36		4		52		20		
09:45	18	89	13	54	24	173	5	32	42	262	18	86	
10:00	17		10		28		7		45		17		
10:15	13		6		16		2		29		8		
10:30	14		6		15		1		29		7		
10:45	17	61	3	25	26	85	2	12	43	146	5	37	
11:00	15		3		32		4		47		7		
11:15	23		4		25		2		48		6		
11:30	32		3		21		1		53		4		
11:45	21	91	0	10	38	116	0	7	59	207	0	17	
Total	691		1253		1004		1345		1695		2598		
Percent	40.8%		48.2%		59.2%		51.8%						
Day Total		1944				2349				4293			
Peak	07:00	-	05:00	-	07:30	-	03:30	-	07:30	-	05:15	-	-	-
Vol.	202	-	237	-	292	-	247	-	463	-	463	-	-	-
P.H.F.	0.871		0.898		0.849		0.936		0.933		0.941			

Belknap Road
west of Woodmere Road
City, State: Framingham, MA
Client: GPI/ N. Rogers

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

165016 B CLASS
Site Code: 2015047.05
Date Start: 29-Mar-16

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/29/1														
6	0	2	0	0	0	0	0	0	0	0	0	0	0	2
01:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
04:00	0	9	0	0	1	0	0	0	0	0	0	0	0	10
05:00	0	12	5	0	0	0	0	0	0	0	0	0	0	17
06:00	0	55	11	1	2	0	0	0	0	0	0	0	0	69
07:00	2	174	17	2	1	0	0	0	0	0	0	0	0	196
08:00	1	226	18	2	2	0	0	0	0	0	0	0	0	249
09:00	0	129	10	0	2	2	0	0	0	0	0	0	0	143
10:00	0	66	13	0	7	0	0	0	0	0	0	0	0	86
11:00	0	70	6	0	4	0	0	2	1	0	0	0	0	83
12 PM	0	93	13	0	1	0	0	1	0	0	0	0	0	108
13:00	0	96	8	1	4	1	0	0	1	0	0	0	0	111
14:00	0	127	16	7	5	0	0	1	0	0	0	0	0	156
15:00	0	193	24	4	8	2	0	0	0	0	0	0	0	231
16:00	0	190	19	0	4	1	0	1	0	0	0	0	0	215
17:00	0	221	19	2	2	0	0	0	0	0	0	0	0	244
18:00	0	181	13	0	0	0	0	0	0	0	0	0	0	194
19:00	0	96	8	0	5	0	0	0	0	0	0	0	0	109
20:00	0	54	2	0	0	0	0	0	0	0	0	0	0	56
21:00	0	19	4	0	0	0	0	0	0	0	0	0	0	23
22:00	0	22	2	0	0	0	0	0	0	0	0	0	0	24
23:00	0	12	1	0	0	0	0	0	0	0	0	0	0	13
Total	3	2054	209	19	48	6	0	5	2	0	0	0	0	2346
Percent	0.1%	87.6%	8.9%	0.8%	2.0%	0.3%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	08:00	08:00	07:00	10:00	09:00		11:00	11:00					08:00
Vol.	2	226	18	2	7	2		2	1					249
PM Peak		17:00	15:00	14:00	15:00	15:00		12:00	13:00					17:00
Vol.		221	24	7	8	2		1	1					244

Belknap Road
west of Woodmere Road
City, State: Framingham, MA
Client: GPI/ N. Rogers

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Email: datarequests@pdillc.com

165016 B CLASS
Site Code: 2015047.05
Date Start: 29-Mar-16

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/30/1														
6	0	5	0	0	0	0	0	0	0	0	0	0	0	5
01:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
04:00	0	7	0	0	0	0	0	0	0	0	0	0	0	7
05:00	0	20	1	0	0	0	0	0	0	0	0	0	0	21
06:00	0	55	16	1	4	0	0	0	0	0	0	0	0	76
07:00	0	164	13	3	3	0	0	0	0	0	0	0	0	183
08:00	0	221	14	2	3	0	0	1	0	0	0	0	0	241
09:00	0	133	14	1	3	0	0	0	0	0	0	0	0	151
10:00	0	66	9	0	5	0	0	0	0	0	0	0	0	80
11:00	1	89	15	0	5	0	0	0	0	0	0	0	0	110
12 PM	2	84	5	0	2	0	0	0	0	0	0	0	0	93
13:00	0	84	9	1	1	1	0	0	0	0	0	0	0	96
14:00	4	113	16	7	2	0	0	0	0	0	0	0	0	142
15:00	1	202	28	5	5	1	0	1	0	0	0	0	0	243
16:00	1	218	18	1	3	0	0	0	0	0	0	0	0	241
17:00	0	196	33	0	4	0	0	0	0	0	0	0	0	233
18:00	0	181	18	0	1	0	0	0	0	0	0	0	0	200
19:00	0	85	8	0	2	0	0	0	0	0	0	0	0	95
20:00	0	55	4	0	0	0	0	0	0	0	0	0	0	59
21:00	0	28	4	0	0	0	0	0	0	0	0	0	0	32
22:00	0	17	0	0	0	0	0	0	0	0	0	0	0	17
23:00	0	6	2	0	0	0	0	0	0	0	0	0	0	8
Total	9	2033	227	21	43	2	0	2	0	0	0	0	0	2337
Percent	0.4%	87.0%	9.7%	0.9%	1.8%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	08:00	06:00	07:00	10:00			08:00						08:00
Vol.	1	221	16	3	5			1						241
PM Peak	14:00	16:00	17:00	14:00	15:00	13:00		15:00						15:00
Vol.	4	218	33	7	5	1		1						243
Total		4087	436	40	91	8	0	7	2	0	0	0	0	4683

Belknap Road
west of Woodmere Road
City, State: Framingham, MA
Client: GPI/ N. Rogers

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165016 B CLASS
Site Code: 2015047.05
Date Start: 29-Mar-16

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/29/1														
6	0	1	0	0	0	0	0	0	0	0	0	0	0	1
01:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
04:00	0	2	1	0	0	0	0	0	0	0	0	0	0	3
05:00	0	18	1	0	0	0	0	0	0	0	0	0	0	19
06:00	0	98	4	3	2	0	0	0	0	0	0	0	0	107
07:00	0	214	15	3	3	1	0	2	0	0	0	0	0	238
08:00	1	162	14	1	3	1	0	1	0	0	0	0	0	183
09:00	0	103	12	0	0	0	0	0	0	0	0	0	0	115
10:00	0	73	9	0	1	0	0	0	0	0	0	0	0	83
11:00	0	75	11	0	1	0	0	0	0	0	0	0	0	87
12 PM	0	85	5	0	2	0	0	1	0	0	0	0	0	93
13:00	0	60	7	1	3	0	0	0	0	0	0	0	0	71
14:00	0	94	10	1	3	1	0	0	0	0	0	0	0	109
15:00	0	130	12	1	2	1	0	0	0	0	0	0	0	146
16:00	0	165	19	0	2	1	0	0	0	0	0	0	0	187
17:00	1	217	11	0	1	0	0	1	0	0	0	0	0	231
18:00	0	137	13	0	0	0	0	0	0	0	0	0	0	150
19:00	0	85	4	0	1	0	0	0	0	0	0	0	0	90
20:00	0	38	5	0	0	0	0	0	0	0	0	0	0	43
21:00	0	25	0	0	0	0	0	0	0	0	0	0	0	25
22:00	0	13	0	0	0	0	0	0	0	0	0	0	0	13
23:00	0	8	0	0	0	0	0	0	0	0	0	0	0	8
Total	2	1808	154	10	24	5	0	5	0	0	0	0	0	2008
Percent	0.1%	90.0%	7.7%	0.5%	1.2%	0.2%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	07:00	07:00	06:00	07:00	07:00		07:00						07:00
Vol.	1	214	15	3	3	1		2						238
PM Peak	17:00	17:00	16:00	13:00	13:00	14:00		12:00						17:00
Vol.	1	217	19	1	3	1		1						231

Belknap Road
west of Woodmere Road
City, State: Framingham, MA
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165016 B CLASS
Site Code: 2015047.05
Date Start: 29-Mar-16

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/30/1														
6	0	1	0	0	0	0	0	0	0	0	0	0	0	1
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
05:00	0	14	1	0	1	0	0	0	0	0	0	0	0	16
06:00	0	98	6	4	1	0	0	1	0	0	0	0	0	110
07:00	0	237	12	1	2	0	0	0	0	0	0	0	0	252
08:00	0	161	14	0	2	0	0	1	0	0	0	0	0	178
09:00	0	87	12	0	2	0	0	0	0	0	0	0	0	101
10:00	0	60	6	0	1	0	0	0	0	0	0	0	0	67
11:00	0	79	10	0	1	0	0	0	0	0	0	0	0	90
12 PM	0	74	12	0	0	0	0	0	0	0	0	0	0	86
13:00	1	74	6	1	1	0	0	0	0	0	0	0	0	83
14:00	0	101	4	1	2	1	0	0	0	0	0	0	0	109
15:00	0	127	17	1	1	0	0	0	0	0	0	0	0	146
16:00	1	149	14	0	1	0	0	0	0	0	0	0	0	165
17:00	0	199	10	0	1	1	0	0	0	0	0	0	0	211
18:00	0	122	12	0	0	0	0	0	0	0	0	0	0	134
19:00	0	60	4	0	0	0	0	0	0	0	0	0	0	64
20:00	0	46	1	0	0	0	0	0	0	0	0	0	0	47
21:00	0	37	2	0	0	0	0	0	0	0	0	0	0	39
22:00	1	14	1	0	0	0	0	0	0	0	0	0	0	16
23:00	0	8	2	0	0	0	0	0	0	0	0	0	0	10
Total	3	1752	147	8	16	2	0	2	0	0	0	0	0	1930
Percent	0.2%	90.8%	7.6%	0.4%	0.8%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak		07:00	08:00	06:00	07:00			06:00						07:00
Vol.		237	14	4	2			1						252
PM Peak	13:00	17:00	15:00	13:00	14:00	14:00								17:00
Vol.	1	199	17	1	2	1								211
Total		3560	301	18	40	7	0	7	0	0	0	0	0	3938

Belknap Road
west of Woodmere Road
City, State: Framingham, MA
Client: GPI/ N. Rogers

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

165016 B SPEED
Site Code: 2015047.05
Date Start: 29-Mar-16

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
03/29/ 16	0	0	0	1	1	0	0	0	0	0	0	0	0	2	32	30
01:00	0	1	1	1	0	1	0	0	0	0	0	0	0	4	36	26
02:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1	23	22
03:00	0	0	1	0	1	0	0	0	0	0	0	0	0	2	32	27
04:00	1	0	1	1	6	1	0	0	0	0	0	0	0	10	33	29
05:00	0	0	0	8	5	4	0	0	0	0	0	0	0	17	35	31
06:00	0	2	3	16	34	13	1	0	0	0	0	0	0	69	35	31
07:00	**3**	**6**	8	48	87	43	1	0	0	0	0	0	0	196	35	31
08:00	0	3	**10**	**52**	**131**	**50**	3	0	0	0	0	0	0	**249**	35	31
09:00	0	2	4	36	64	33	**4**	0	0	0	0	0	0	143	36	32
10:00	0	0	2	25	43	12	4	0	0	0	0	0	0	86	35	31
11:00	**1**	1	**7**	21	35	16	2	0	0	0	0	0	0	83	35	31
12 PM	0	**2**	5	22	42	**34**	3	0	0	0	0	0	0	108	37	32
13:00	1	1	6	26	45	27	5	0	0	0	0	0	0	111	36	32
14:00	0	0	7	**29**	**83**	29	**7**	**1**	0	0	0	0	0	**156**	36	32
15:00	0	**3**	10	**52**	116	47	3	0	0	0	0	0	0	231	35	31
16:00	0	0	2	33	108	60	**12**	0	0	0	0	0	0	215	37	33
17:00	0	1	**11**	36	**123**	**69**	4	0	0	0	0	0	0	**244**	36	32
18:00	0	0	5	29	106	47	7	0	0	0	0	0	0	194	36	33
19:00	0	0	5	30	55	18	1	0	0	0	0	0	0	109	34	31
20:00	0	2	2	22	24	4	1	**1**	0	0	0	0	0	56	33	30
21:00	0	0	1	8	8	6	0	0	0	0	0	0	0	23	36	31
22:00	0	1	1	4	11	7	0	0	0	0	0	0	0	24	36	32
23:00	0	0	0	2	9	2	0	0	0	0	0	0	0	13	34	32
Total	6	25	93	502	1137	523	58	2	0	0	0	0	0	2346		
%	0.3%	1.1%	4.0%	21.4%	48.5%	22.3%	2.5%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	07:00	08:00	08:00	08:00	08:00	09:00							08:00		
Vol.	3	6	10	52	131	50	4							249		
Midday Peak	11:00	12:00	11:00	14:00	14:00	12:00	14:00	14:00						14:00		
Vol.	1	2	7	29	83	34	7	1						156		
PM Peak		15:00	17:00	15:00	17:00	17:00	16:00	20:00						17:00		
Vol.		3	11	52	123	69	12	1						244		

% iles		
	15th Percentile :	26 MPH
	50th Percentile :	31 MPH
	85th Percentile :	36 MPH
	95th Percentile :	38 MPH

Stats		
	10 MPH Pace Speed :	30-39 MPH
	Number in Pace :	1660
	Percent in Pace :	70.8%
	Number of Vehicles > 25 MPH :	2122
	Percent of Vehicles > 25 MPH :	90.4%
	Mean Speed(Average) :	32 MPH

Belknap Road
west of Woodmere Road
City, State: Framingham, MA
Client: GPI/ N. Rogers

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

165016 B SPEED
Site Code: 2015047.05
Date Start: 29-Mar-16

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
03/30/ 16	0	0	0	3	1	1	0	0	0	0	0	0	0	5	35	30
01:00	0	1	0	0	1	0	0	0	0	0	0	0	0	2	32	25
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	2	0	0	0	0	0	0	0	0	2	33	32
04:00	0	1	0	0	4	1	1	0	0	0	0	0	0	7	38	32
05:00	0	0	0	11	3	6	1	0	0	0	0	0	0	21	37	31
06:00	0	0	2	20	45	9	0	0	0	0	0	0	0	76	33	31
07:00	0	0	8	41	89	**42**	3	0	0	0	0	0	0	183	36	32
08:00	**3**	**3**	**12**	**63**	**119**	39	2	0	0	0	0	0	0	**241**	34	31
09:00	0	0	2	26	86	31	**5**	**1**	0	0	0	0	0	151	36	32
10:00	0	1	3	18	34	17	6	1	0	0	0	0	0	80	37	32
11:00	0	2	2	29	53	21	3	0	0	0	0	0	0	110	35	31
12 PM	0	0	**5**	20	51	14	3	0	0	0	0	0	0	93	35	31
13:00	0	1	1	17	48	25	4	0	0	0	0	0	0	96	36	33
14:00	0	**3**	5	**32**	**60**	**37**	**5**	0	0	0	0	0	0	**142**	36	32
15:00	1	**1**	**6**	**68**	112	50	3	**2**	0	0	0	0	0	**243**	35	31
16:00	0	1	3	51	**128**	53	3	2	0	0	0	0	0	241	36	32
17:00	0	0	4	47	105	**71**	**6**	0	0	0	0	0	0	233	36	33
18:00	**3**	1	6	32	100	54	3	1	0	0	0	0	0	200	36	32
19:00	0	1	5	24	49	16	0	0	0	0	0	0	0	95	34	31
20:00	1	1	0	17	27	10	2	1	0	0	0	0	0	59	36	31
21:00	0	0	1	9	17	5	0	0	0	0	0	0	0	32	34	31
22:00	0	0	2	3	10	2	0	0	0	0	0	0	0	17	33	31
23:00	0	0	0	1	7	0	0	0	0	0	0	0	0	8	33	31
Total	8	17	67	532	1151	504	50	8	0	0	0	0	0	2337		
%	0.3%	0.7%	2.9%	22.8%	49.3%	21.6%	2.1%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	08:00	08:00	08:00	07:00	09:00	09:00						08:00		
Vol.	3	3	12	63	119	42	5	1						241		
Midday Peak		14:00	12:00	14:00	14:00	14:00	14:00							14:00		
Vol.		3	5	32	60	37	5							142		
PM Peak	18:00	15:00	15:00	15:00	16:00	17:00	17:00	15:00						15:00		
Vol.	3	1	6	68	128	71	6	2						243		

% iles	15th Percentile :	26 MPH
	50th Percentile :	31 MPH
	85th Percentile :	36 MPH
	95th Percentile :	38 MPH

Stats	10 MPH Pace Speed :	25-34 MPH
	Number in Pace :	1683
	Percent in Pace :	72.0%
	Number of Vehicles > 25 MPH :	2139
	Percent of Vehicles > 25 MPH :	91.5%
	Mean Speed(Average) :	32 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Belknap Road
west of Woodmere Road
City, State: Framingham, MA
Client: GPI/ N. Rogers

165016 B SPEED
Site Code: 2015047.05
Date Start: 29-Mar-16

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
03/29/ 16	0	0	0	0	1	0	0	0	0	0	0	0	0	1	33	32
01:00	0	0	1	1	1	1	0	0	0	0	0	0	0	4	36	29
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	**1**	0	0	0	1	0	0	0	0	0	0	0	0	2	32	20
04:00	0	1	0	2	0	0	0	0	0	0	0	0	0	3	27	24
05:00	0	1	2	5	8	3	0	0	0	0	0	0	0	19	34	30
06:00	1	2	6	26	54	14	**4**	0	0	0	0	0	0	107	34	31
07:00	0	**6**	**26**	**74**	**96**	**33**	2	**1**	0	0	0	0	0	**238**	34	30
08:00	0	1	7	74	80	20	1	0	0	0	0	0	0	183	33	30
09:00	0	2	11	24	62	14	2	0	0	0	0	0	0	115	33	31
10:00	1	0	2	23	48	7	2	0	0	0	0	0	0	83	33	31
11:00	0	0	3	23	45	15	**1**	0	0	0	0	0	0	87	34	31
12 PM	0	0	**7**	23	**46**	17	0	0	0	0	0	0	0	93	34	31
13:00	0	0	5	20	33	13	0	0	0	0	0	0	0	71	34	31
14:00	0	**1**	6	**40**	43	**18**	1	0	0	0	0	0	0	**109**	34	30
15:00	0	**2**	**15**	40	71	17	1	0	0	0	0	0	0	146	33	30
16:00	**1**	1	10	47	100	**28**	0	0	0	0	0	0	0	187	33	31
17:00	0	0	12	**72**	**117**	27	**3**	0	0	0	0	0	0	**231**	33	31
18:00	0	0	0	36	89	24	1	0	0	0	0	0	0	150	34	32
19:00	0	2	3	32	48	3	2	0	0	0	0	0	0	90	33	30
20:00	0	0	4	15	18	5	1	0	0	0	0	0	0	43	33	30
21:00	0	0	2	8	13	2	0	0	0	0	0	0	0	25	33	30
22:00	0	0	0	4	6	3	0	0	0	0	0	0	0	13	35	32
23:00	0	0	1	2	3	2	0	0	0	0	0	0	0	8	36	31
Total	4	19	123	591	983	266	21	1	0	0	0	0	0	2008		
%	0.2%	0.9%	6.1%	29.4%	49.0%	13.2%	1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	03:00	07:00	07:00	07:00	07:00	07:00	06:00	07:00						07:00		
Vol.	1	6	26	74	96	33	4	1						238		
Midday Peak		14:00	12:00	14:00	12:00	14:00	11:00							14:00		
Vol.		1	7	40	46	18	1							109		
PM Peak	16:00	15:00	15:00	17:00	17:00	16:00	17:00							17:00		
Vol.	1	2	15	72	117	28	3							231		

% iles

15th Percentile : 25 MPH
50th Percentile : 30 MPH
85th Percentile : 33 MPH
95th Percentile : 37 MPH

Stats

10 MPH Pace Speed : 25-34 MPH
Number in Pace : 1574
Percent in Pace : 78.4%
Number of Vehicles > 25 MPH : 1744
Percent of Vehicles > 25 MPH : 86.8%
Mean Speed(Average) : 30 MPH

PRECISION
D A T A
INDUSTRIES, LLC
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Belknap Road
west of Woodmere Road
City, State: Framingham, MA
Client: GPI/ N. Rogers

165016 B SPEED
Site Code: 2015047.05
Date Start: 29-Mar-16

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
03/30/ 16	0	0	0	0	0	1	0	0	0	0	0	0	0	1	38	37
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1	33	32
04:00	0	0	1	1	0	2	0	0	0	0	0	0	0	4	37	31
05:00	0	0	2	5	7	2	0	0	0	0	0	0	0	16	33	30
06:00	**6**	**2**	9	29	50	14	0	0	0	0	0	0	0	110	33	29
07:00	0	2	**13**	**56**	**135**	**40**	**6**	0	0	0	0	0	0	**252**	35	31
08:00	0	0	10	56	94	17	1	0	0	0	0	0	0	178	33	30
09:00	0	1	10	31	40	19	0	0	0	0	0	0	0	101	35	30
10:00	1	0	3	15	36	7	5	0	0	0	0	0	0	67	35	31
11:00	0	**1**	5	24	43	15	**2**	0	0	0	0	0	0	90	35	31
12 PM	0	0	2	28	31	**23**	2	0	0	0	0	0	0	86	36	32
13:00	0	0	5	21	43	13	0	**1**	0	0	0	0	0	83	34	31
14:00	**1**	1	**10**	**38**	**49**	10	0	0	0	0	0	0	0	**109**	33	29
15:00	0	**1**	**8**	59	65	12	0	**1**	0	0	0	0	0	146	33	30
16:00	0	1	8	42	89	22	3	0	0	0	0	0	0	165	34	31
17:00	0	0	6	**69**	**105**	**26**	**5**	0	0	0	0	0	0	**211**	33	31
18:00	0	0	6	24	79	24	1	0	0	0	0	0	0	134	35	32
19:00	**1**	0	5	24	25	8	1	0	0	0	0	0	0	64	33	30
20:00	0	0	1	18	16	9	3	0	0	0	0	0	0	47	36	31
21:00	0	0	4	11	16	8	0	0	0	0	0	0	0	39	35	31
22:00	0	0	1	0	9	5	1	0	0	0	0	0	0	16	37	34
23:00	0	0	1	1	6	2	0	0	0	0	0	0	0	10	35	32
Total	9	9	110	552	939	279	30	2	0	0	0	0	0	1930		
%	0.5%	0.5%	5.7%	28.6%	48.7%	14.5%	1.6%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	06:00	06:00	07:00	07:00	07:00	07:00	07:00							07:00		
Vol.	6	2	13	56	135	40	6							252		
Midday Peak	14:00	11:00	14:00	14:00	14:00	12:00	11:00	13:00						14:00		
Vol.	1	1	10	38	49	23	2	1						109		
PM Peak	19:00	15:00	15:00	17:00	17:00	17:00	17:00	15:00						17:00		
Vol.	1	1	8	69	105	26	5	1						211		

% iles		
	15th Percentile :	25 MPH
	50th Percentile :	30 MPH
	85th Percentile :	34 MPH
	95th Percentile :	37 MPH

Stats		
	10 MPH Pace Speed :	25-34 MPH
	Number in Pace :	1491
	Percent in Pace :	77.3%
	Number of Vehicles > 25 MPH :	1692
	Percent of Vehicles > 25 MPH :	87.6%
	Mean Speed(Average) :	31 MPH

Belknap Road
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165016 B VOLUME
Site Code: 2015047.05
Date Start: 29-Mar-16

Start	WB				EB				Combined				29-Mar-16
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	2		22		0		30		2		52		
12:15	0		26		0		24		0		50		
12:30	0		27		0		25		0		52		
12:45	0	2	33	108	1	1	14	93	1	3	47	201	
01:00	1		26		0		16		1		42		
01:15	2		27		0		19		2		46		
01:30	1		19		1		23		2		42		
01:45	0	4	39	111	3	4	13	71	3	8	52	182	
02:00	0		31		0		22		0		53		
02:15	0		32		0		29		0		61		
02:30	1		46		0		25		1		71		
02:45	0	1	47	156	0	0	33	109	0	1	80	265	
03:00	1		49		1		34		2		83		
03:15	0		65		0		40		0		105		
03:30	0		59		1		30		1		89		
03:45	1	2	58	231	0	2	42	146	1	4	100	377	
04:00	0		50		0		41		0		91		
04:15	2		68		0		43		2		111		
04:30	4		51		1		55		5		106		
04:45	4	10	46	215	2	3	48	187	6	13	94	402	
05:00	3		52		1		53		4		105		
05:15	5		52		2		67		7		119		
05:30	3		62		10		52		13		114		
05:45	6	17	78	244	6	19	59	231	12	36	137	475	
06:00	8		52		10		45		18		97		
06:15	15		52		12		32		27		84		
06:30	23		50		27		36		50		86		
06:45	23	69	40	194	58	107	37	150	81	176	77	344	
07:00	35		33		54		26		89		59		
07:15	40		33		62		27		102		60		
07:30	68		26		63		14		131		40		
07:45	53	196	17	109	59	238	23	90	112	434	40	199	
08:00	62		14		44		17		106		31		
08:15	74		10		43		17		117		27		
08:30	57		12		48		4		105		16		
08:45	56	249	20	56	48	183	5	43	104	432	25	99	
09:00	49		9		41		4		90		13		
09:15	42		8		27		10		69		18		
09:30	28		2		26		5		54		7		
09:45	24	143	4	23	21	115	6	25	45	258	10	48	
10:00	27		8		25		4		52		12		
10:15	21		6		11		1		32		7		
10:30	20		6		24		6		44		12		
10:45	18	86	4	24	23	83	2	13	41	169	6	37	
11:00	21		3		22		3		43		6		
11:15	25		6		18		2		43		8		
11:30	19		3		24		1		43		4		
11:45	18	83	1	13	23	87	2	8	41	170	3	21	
Total	862		1484		842		1166		1704		2650		
Percent	50.6%		56.0%		49.4%		44.0%						
Day Total		2346				2008				4354			
Peak	07:30	-	05:00	-	07:00	-	05:00	-	07:30	-	05:00	-	-	-
Vol.	257	-	244	-	238	-	231	-	466	-	475	-	-	-
P.H.F.	0.868		0.782		0.944		0.862		0.889		0.867			

Belknap Road
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165016 B VOLUME
Site Code: 2015047.05
Date Start: 29-Mar-16

Start	WB				EB				Combined				30-Mar-16
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	3		22		0		18		3		40		
12:15	0		23		0		21		0		44		
12:30	1		21		0		23		1		44		
12:45	1	5	27	93	1	1	24	86	2	6	51	179	
01:00	1		31		0		18		1		49		
01:15	1		24		0		21		1		45		
01:30	0		24		0		24		0		48		
01:45	0	2	17	96	0	0	20	83	0	2	37	179	
02:00	0		34		0		25		0		59		
02:15	0		29		0		33		0		62		
02:30	0		38		0		23		0		61		
02:45	0	0	41	142	0	0	28	109	0	0	69	251	
03:00	0		53		0		33		0		86		
03:15	0		62		0		34		0		96		
03:30	2		70		0		30		2		100		
03:45	0	2	58	243	1	1	49	146	1	3	107	389	
04:00	1		68		1		46		2		114		
04:15	1		67		0		35		1		102		
04:30	2		59		0		39		2		98		
04:45	3	7	47	241	3	4	45	165	6	11	92	406	
05:00	4		59		1		48		5		107		
05:15	3		50		4		55		7		105		
05:30	5		68		6		50		11		118		
05:45	9	21	56	233	5	16	58	211	14	37	114	444	
06:00	11		63		11		42		22		105		
06:15	13		53		14		34		27		87		
06:30	23		40		31		28		54		68		
06:45	29	76	44	200	54	110	30	134	83	186	74	334	
07:00	37		28		65		21		102		49		
07:15	32		28		62		19		94		47		
07:30	49		25		64		13		113		38		
07:45	65	183	14	95	61	252	11	64	126	435	25	159	
08:00	61		19		47		13		108		32		
08:15	77		17		46		13		123		30		
08:30	53		13		43		12		96		25		
08:45	50	241	10	59	42	178	9	47	92	419	19	106	
09:00	55		11		29		12		84		23		
09:15	43		8		31		10		74		18		
09:30	31		8		20		8		51		16		
09:45	22	151	5	32	21	101	9	39	43	252	14	71	
10:00	20		8		18		5		38		13		
10:15	22		4		21		4		43		8		
10:30	18		2		14		5		32		7		
10:45	20	80	3	17	14	67	2	16	34	147	5	33	
11:00	29		2		17		5		46		7		
11:15	23		3		24		3		47		6		
11:30	18		2		24		2		42		4		
11:45	40	110	1	8	25	90	0	10	65	200	1	18	
Total	878		1459		820		1110		1698		2569		
Percent	51.7%		56.8%		48.3%		43.2%						
Day Total		2337				1930				4267			
Peak	07:45	-	03:30	-	07:00	-	05:00	-	07:30	-	05:00	-	-	-
Vol.	256	-	263	-	252	-	211	-	470	-	444	-	-	-
P.H.F.	0.831		0.939		0.969		0.909		0.933		0.941			

Winch Street
east of Millwood Street
City, State: Framingham, MA
Client: GPI/ N. Rogers

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

165016 C CLASS
Site Code: 2015047.05
Date Start: 29-Mar-16

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/29/1														
6	0	1	0	0	0	0	0	0	0	0	0	0	0	1
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	0	2	2	0	0	0	0	0	0	0	0	0	0	4
06:00	0	8	4	1	0	0	0	0	0	0	0	0	0	13
07:00	0	20	4	1	1	0	0	0	0	0	0	0	0	26
08:00	0	40	4	0	0	0	0	0	0	0	0	0	0	44
09:00	0	39	2	1	0	1	0	0	0	0	0	0	0	43
10:00	0	29	6	0	2	1	0	1	0	0	0	0	0	39
11:00	1	26	4	0	1	0	0	0	0	0	0	0	0	32
12 PM	0	34	2	0	0	0	0	0	0	0	0	0	0	36
13:00	0	27	2	0	0	0	0	0	0	0	0	0	0	29
14:00	1	18	3	0	0	0	0	1	0	0	0	0	0	23
15:00	2	40	8	0	3	0	0	0	0	0	0	0	0	53
16:00	1	50	6	0	3	0	0	0	0	0	0	0	0	60
17:00	0	51	5	1	2	0	0	0	0	0	0	0	0	59
18:00	0	46	2	0	0	0	0	0	0	0	0	0	0	48
19:00	0	19	1	0	0	0	0	0	0	0	0	0	0	20
20:00	0	9	0	0	0	0	0	0	0	0	0	0	0	9
21:00	0	10	0	0	0	0	0	0	0	0	0	0	0	10
22:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
23:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Total	5	474	56	4	12	2	0	2	0	0	0	0	0	555
Percent	0.9%	85.4%	10.1%	0.7%	2.2%	0.4%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	08:00	10:00	06:00	10:00	09:00		10:00						08:00
Vol.	1	40	6	1	2	1		1						44
PM Peak	15:00	17:00	15:00	17:00	15:00			14:00						16:00
Vol.	2	51	8	1	3			1						60

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WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/30/1														
6	0	3	0	0	0	0	0	0	0	0	0	0	0	3
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
06:00	0	9	4	1	0	0	0	0	0	0	0	0	0	14
07:00	0	16	10	1	0	0	0	0	0	0	0	0	0	27
08:00	0	40	10	0	0	0	0	1	0	0	0	0	0	51
09:00	0	25	5	0	1	0	0	0	0	0	0	0	0	31
10:00	0	24	5	0	2	0	0	0	0	0	0	0	0	31
11:00	1	20	2	0	0	0	0	0	0	0	0	0	0	23
12 PM	0	22	6	0	0	0	0	0	0	0	0	0	0	28
13:00	0	31	3	0	1	0	0	0	0	0	0	0	0	35
14:00	2	26	3	1	0	0	0	0	0	0	0	0	0	32
15:00	0	37	5	1	3	0	0	0	0	0	0	0	0	46
16:00	1	55	8	0	1	0	0	2	0	0	0	0	0	67
17:00	1	47	3	0	0	0	0	0	0	0	0	0	0	51
18:00	0	37	2	0	3	0	0	0	0	0	0	0	0	42
19:00	1	15	1	0	0	0	0	0	0	0	0	0	0	17
20:00	0	7	0	0	1	0	0	0	0	0	0	0	0	8
21:00	0	2	1	0	0	0	0	0	0	0	0	0	0	3
22:00	0	4	1	0	0	0	0	0	0	0	0	0	0	5
23:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
Total	6	426	69	4	12	0	0	3	0	0	0	0	0	520
Percent	1.2%	81.9%	13.3%	0.8%	2.3%	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	08:00	07:00	06:00	10:00			08:00						08:00
Vol.	1	40	10	1	2			1						51
PM Peak	14:00	16:00	16:00	14:00	15:00			16:00						16:00
Vol.	2	55	8	1	3			2						67
Total		900	125	8	24	2	0	5	0	0	0	0	0	1075

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165016 C CLASS
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Date Start: 29-Mar-16

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/29/1														
6	0	1	0	0	0	0	0	0	0	0	0	0	0	1
01:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
06:00	0	15	5	0	0	0	0	0	0	0	0	0	0	20
07:00	0	35	6	1	1	0	0	0	0	0	0	0	0	43
08:00	0	40	7	1	1	0	0	0	0	0	0	0	0	49
09:00	0	51	2	1	0	0	0	0	0	0	0	0	0	54
10:00	0	27	1	0	0	0	0	0	0	0	0	0	0	28
11:00	0	32	1	0	0	0	0	0	0	0	0	0	0	33
12 PM	0	28	4	0	0	0	0	0	0	0	0	0	0	32
13:00	0	38	4	0	2	0	0	0	0	0	0	0	0	44
14:00	0	26	3	0	1	0	0	0	0	0	0	0	0	30
15:00	0	47	4	0	0	1	0	0	0	0	0	0	0	52
16:00	0	71	6	0	0	1	0	1	0	0	0	0	0	79
17:00	0	66	5	0	0	0	0	0	0	0	0	0	0	71
18:00	0	42	6	0	0	0	0	0	0	0	0	0	0	48
19:00	0	36	0	0	0	0	0	0	0	0	0	0	0	36
20:00	0	11	3	0	0	0	0	0	0	0	0	0	0	14
21:00	0	12	1	0	0	0	0	0	0	0	0	0	0	13
22:00	0	5	0	0	0	0	0	0	0	0	0	0	0	5
23:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	588	58	3	5	2	0	1	0	0	0	0	0	657
Percent	0.0%	89.5%	8.8%	0.5%	0.8%	0.3%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak		09:00	08:00	07:00	07:00									09:00
Vol.		51	7	1	1									54
PM Peak		16:00	16:00		13:00	15:00		16:00						16:00
Vol.		71	6		2	1		1						79

Winch Street
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165016 C CLASS
Site Code: 2015047.05
Date Start: 29-Mar-16

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/30/1														
6	0	2	0	0	0	0	0	0	0	0	0	0	0	2
01:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
06:00	0	14	4	0	0	0	0	0	0	0	0	0	0	18
07:00	0	30	5	1	1	0	0	0	0	0	0	0	0	37
08:00	0	45	10	1	3	0	0	0	0	0	0	0	0	59
09:00	0	42	5	0	0	0	0	0	0	0	0	0	0	47
10:00	0	33	7	0	0	0	0	0	0	0	0	0	0	40
11:00	0	26	1	0	0	0	0	0	0	0	0	0	0	27
12 PM	0	24	5	0	0	0	0	0	0	0	0	0	0	29
13:00	0	38	9	0	1	0	0	0	0	0	0	0	0	48
14:00	0	29	5	0	1	0	0	0	0	0	0	0	0	35
15:00	0	36	3	0	0	0	0	0	0	0	0	0	0	39
16:00	0	49	7	0	0	0	0	0	0	0	0	0	0	56
17:00	0	72	2	0	0	0	0	0	0	0	0	0	0	74
18:00	0	53	7	0	0	0	0	0	0	0	0	0	0	60
19:00	0	30	1	0	0	0	0	0	0	0	0	0	0	31
20:00	1	15	0	0	0	0	0	0	0	0	0	0	0	16
21:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
22:00	0	1	2	0	0	0	0	0	0	0	0	0	0	3
23:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Total	1	549	73	2	6	0	0	0	0	0	0	0	0	631
Percent	0.2%	87.0%	11.6%	0.3%	1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak		08:00	08:00	07:00	08:00									08:00
Vol.		45	10	1	3									59
PM Peak	20:00	17:00	13:00		13:00									17:00
Vol.	1	72	9		1									74
Total		1137	131	5	11	2	0	1	0	0	0	0	0	1288

PRECISION
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Winch Street
east of Millwood Street
City, State: Framingham, MA
Client: GPI/ N. Rogers

165016 C SPEED
Site Code: 2015047.05
Date Start: 29-Mar-16

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
03/29/ 16	0	0	0	1	0	0	0	0	0	0	0	0	0	1	28	27
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1	23	22
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
05:00	0	0	2	2	0	0	0	0	0	0	0	0	0	4	27	25
06:00	1	2	3	7	0	0	0	0	0	0	0	0	0	13	27	23
07:00	0	2	12	7	**5**	0	0	0	0	0	0	0	0	26	30	25
08:00	0	4	**15**	**20**	5	0	0	0	0	0	0	0	0	**44**	28	25
09:00	**2**	**5**	14	17	3	**2**	0	0	0	0	0	0	0	43	28	24
10:00	1	10	12	12	4	0	0	0	0	0	0	0	0	39	28	23
11:00	2	1	**20**	8	0	**1**	0	0	0	0	0	0	0	32	26	23
12 PM	**7**	**3**	10	**11**	**5**	0	0	0	0	0	0	0	0	**36**	28	22
13:00	7	2	13	6	1	0	0	0	0	0	0	0	0	29	26	20
14:00	2	2	10	8	1	0	0	0	0	0	0	0	0	23	27	22
15:00	**5**	4	22	16	6	0	0	0	0	0	0	0	0	53	28	23
16:00	5	7	**25**	**23**	1	0	0	0	0	0	0	0	0	**61**	27	22
17:00	5	**10**	15	21	9	0	0	0	0	0	0	0	0	60	28	23
18:00	3	4	16	14	**11**	0	0	0	0	0	0	0	0	48	30	24
19:00	0	4	8	7	1	0	0	0	0	0	0	0	0	20	27	23
20:00	0	0	4	2	3	0	0	0	0	0	0	0	0	9	31	26
21:00	1	1	3	3	2	0	0	0	0	0	0	0	0	10	30	24
22:00	0	1	3	0	0	0	0	0	0	0	0	0	0	4	23	21
23:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1	23	22
Total	41	62	209	185	57	3	0	0	0	0	0	0	0	557		
%	7.4%	11.1%	37.5%	33.2%	10.2%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	09:00	08:00	08:00	07:00	09:00								08:00		
Vol.	2	5	15	20	5	2								44		
Midday Peak	12:00	12:00	11:00	12:00	12:00	11:00								12:00		
Vol.	7	3	20	11	5	1								36		
PM Peak	15:00	17:00	16:00	16:00	18:00									16:00		
Vol.	5	10	25	23	11									61		

% iles		
	15th Percentile :	17 MPH
	50th Percentile :	23 MPH
	85th Percentile :	28 MPH
	95th Percentile :	31 MPH

Stats		
	10 MPH Pace Speed :	20-29 MPH
	Number in Pace :	394
	Percent in Pace :	70.7%
	Number of Vehicles > 20 MPH :	412
	Percent of Vehicles > 20 MPH :	74.0%
	Mean Speed(Average) :	23 MPH

PRECISION
D A T A
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165016 C SPEED
Site Code: 2015047.05
Date Start: 29-Mar-16

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
03/30/ 16	0	0	1	1	1	0	0	0	0	0	0	0	0	3	31	27
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
05:00	0	0	2	1	0	0	0	0	0	0	0	0	0	3	26	24
06:00	0	**3**	4	4	3	0	0	0	0	0	0	0	0	14	30	24
07:00	2	0	10	11	4	0	0	0	0	0	0	0	0	27	28	24
08:00	**3**	3	**17**	**24**	3	**1**	0	0	0	0	0	0	0	**51**	28	24
09:00	1	2	6	15	**7**	0	0	0	0	0	0	0	0	31	30	26
10:00	0	3	14	12	2	0	0	0	0	0	0	0	0	31	27	24
11:00	0	3	11	7	2	0	0	0	0	0	0	0	0	23	27	24
12 PM	1	**7**	11	7	2	0	0	0	0	0	0	0	0	28	27	22
13:00	0	4	**14**	12	**4**	**1**	0	0	0	0	0	0	0	**35**	28	25
14:00	**2**	4	8	**14**	4	0	0	0	0	0	0	0	0	32	28	24
15:00	**1**	2	31	12	0	0	0	0	0	0	0	0	0	46	26	23
16:00	1	2	**42**	20	2	0	0	0	0	0	0	0	0	**67**	26	23
17:00	0	**6**	20	**21**	4	0	0	0	0	0	0	0	0	51	28	24
18:00	0	3	18	14	**7**	0	0	0	0	0	0	0	0	42	29	25
19:00	0	2	4	11	0	0	0	0	0	0	0	0	0	17	27	25
20:00	1	0	3	1	3	0	0	0	0	0	0	0	0	8	32	25
21:00	0	0	2	1	0	0	0	0	0	0	0	0	0	3	26	24
22:00	0	0	2	2	1	0	0	0	0	0	0	0	0	5	30	26
23:00	0	0	1	1	0	**1**	0	0	0	0	0	0	0	3	36	29
Total	12	44	221	191	49	3	0	0	0	0	0	0	0	520		
%	2.3%	8.5%	42.5%	36.7%	9.4%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	06:00	08:00	08:00	09:00	08:00								08:00		
Vol.	3	3	17	24	7	1								51		
Midday Peak	14:00	12:00	13:00	14:00	13:00	13:00								13:00		
Vol.	2	7	14	14	4	1								35		
PM Peak	15:00	17:00	16:00	17:00	18:00	23:00								16:00		
Vol.	1	6	42	21	7	1								67		

% iles	
15th Percentile :	19 MPH
50th Percentile :	23 MPH
85th Percentile :	28 MPH
95th Percentile :	31 MPH

Stats	
10 MPH Pace Speed :	20-29 MPH
Number in Pace :	412
Percent in Pace :	79.2%
Number of Vehicles > 20 MPH :	420
Percent of Vehicles > 20 MPH :	80.7%
Mean Speed(Average) :	24 MPH

Winch Street
east of Millwood Street
City, State: Framingham, MA
Client: GPI/ N. Rogers

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

165016 C SPEED
Site Code: 2015047.05
Date Start: 29-Mar-16

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
03/29/ 16	0	1	0	0	0	0	0	0	0	0	0	0	0	1	18	17
01:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1	23	22
02:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1	23	22
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
05:00	1	0	0	1	0	0	0	0	0	0	0	0	0	2	27	17
06:00	0	4	9	7	0	0	0	0	0	0	0	0	0	20	26	23
07:00	**2**	9	24	8	0	0	0	0	0	0	0	0	0	43	24	21
08:00	2	**13**	19	**14**	**1**	0	0	0	0	0	0	0	0	49	26	22
09:00	1	11	**31**	10	0	**1**	0	0	0	0	0	0	0	**54**	25	22
10:00	2	4	19	3	0	0	0	0	0	0	0	0	0	28	23	21
11:00	4	7	16	6	**1**	0	0	0	0	0	0	0	0	34	25	20
12 PM	4	**11**	12	5	0	0	0	0	0	0	0	0	0	32	24	19
13:00	**8**	10	**19**	**7**	0	0	0	0	0	0	0	0	0	**44**	24	19
14:00	5	10	13	2	0	0	0	0	0	0	0	0	0	30	23	18
15:00	0	13	26	13	0	0	0	0	0	0	0	0	0	52	25	22
16:00	**12**	**29**	30	9	0	0	0	0	0	0	0	0	0	**80**	23	19
17:00	0	13	**35**	**22**	**1**	0	0	0	0	0	0	0	0	71	26	23
18:00	0	11	23	13	1	0	0	0	0	0	0	0	0	48	26	22
19:00	1	5	22	6	1	**1**	0	0	0	0	0	0	0	36	26	22
20:00	0	1	9	4	0	0	0	0	0	0	0	0	0	14	26	23
21:00	0	5	7	1	0	0	0	0	0	0	0	0	0	13	23	20
22:00	0	1	4	0	0	0	0	0	0	0	0	0	0	5	23	21
23:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1	23	22
Total	42	158	321	131	5	2	0	0	0	0	0	0	0	659		
%	6.4%	24.0%	48.7%	19.9%	0.8%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	08:00	09:00	08:00	08:00	09:00								09:00		
Vol.	2	13	31	14	1	1								54		
Midday Peak	13:00	12:00	13:00	13:00	11:00									13:00		
Vol.	8	11	19	7	1									44		
PM Peak	16:00	16:00	17:00	17:00	17:00	19:00								16:00		
Vol.	12	29	35	22	1	1								80		

% iles

15th Percentile :	15 MPH
50th Percentile :	21 MPH
85th Percentile :	25 MPH
95th Percentile :	28 MPH

Stats

10 MPH Pace Speed :	15-24 MPH
Number in Pace :	479
Percent in Pace :	72.7%
Number of Vehicles > 20 MPH :	395
Percent of Vehicles > 20 MPH :	59.9%
Mean Speed(Average) :	21 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Winch Street
east of Millwood Street
City, State: Framingham, MA
Client: GPI/ N. Rogers

165016 C SPEED
Site Code: 2015047.05
Date Start: 29-Mar-16

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
03/30/ 16	0	1	1	0	0	0	0	0	0	0	0	0	0	2	22	20
01:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1	18	17
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1	23	22
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
05:00	1	0	1	2	0	0	0	0	0	0	0	0	0	4	27	21
06:00	0	4	6	6	**2**	0	0	0	0	0	0	0	0	18	28	24
07:00	0	6	20	10	1	0	0	0	0	0	0	0	0	37	26	23
08:00	**5**	**12**	**31**	**11**	0	0	0	0	0	0	0	0	0	**59**	24	21
09:00	0	12	25	10	0	0	0	0	0	0	0	0	0	47	25	22
10:00	3	10	16	11	0	0	0	0	0	0	0	0	0	40	26	21
11:00	1	8	15	3	0	0	0	0	0	0	0	0	0	27	23	21
12 PM	2	11	13	4	0	0	0	0	0	0	0	0	0	30	23	20
13:00	1	**14**	**26**	**7**	0	0	0	0	0	0	0	0	0	**48**	23	21
14:00	**3**	10	19	3	0	0	0	0	0	0	0	0	0	35	23	20
15:00	0	7	27	4	**1**	0	0	0	0	0	0	0	0	39	23	22
16:00	1	**18**	29	7	1	0	0	0	0	0	0	0	0	56	23	21
17:00	1	8	**41**	**23**	1	0	0	0	0	0	0	0	0	**74**	26	23
18:00	1	13	36	10	0	0	0	0	0	0	0	0	0	60	24	22
19:00	1	8	15	6	1	0	0	0	0	0	0	0	0	31	25	22
20:00	**3**	1	5	6	1	0	0	0	0	0	0	0	0	16	27	21
21:00	0	0	3	0	0	0	0	0	0	0	0	0	0	3	23	22
22:00	0	1	1	1	0	0	0	0	0	0	0	0	0	3	26	22
23:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1	28	27
Total	23	145	331	125	8	0	0	0	0	0	0	0	0	632		
%	3.6%	22.9%	52.4%	19.8%	1.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	08:00	08:00	06:00									08:00		
Vol.	5	12	31	11	2									59		
Midday Peak	14:00	13:00	13:00	13:00										13:00		
Vol.	3	14	26	7										48		
PM Peak	20:00	16:00	17:00	17:00	15:00									17:00		
Vol.	3	18	41	23	1									74		

% iles	
15th Percentile :	16 MPH
50th Percentile :	21 MPH
85th Percentile :	25 MPH
95th Percentile :	28 MPH

Stats	
10 MPH Pace Speed :	15-24 MPH
Number in Pace :	476
Percent in Pace :	75.3%
Number of Vehicles > 20 MPH :	398
Percent of Vehicles > 20 MPH :	62.9%
Mean Speed(Average) :	21 MPH

Winch Street
east of Millwood Street
City, State: Framingham, MA
Client: GPI/ N. Rogers

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

165016 C VOLUME
Site Code: 2015047.05
Date Start: 29-Mar-16

Start	WB				EB				Combined				29-Mar-16
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	1		11		0		9		1		20		
12:15	0		1		1		7		1		8		
12:30	0		10		0		4		0		14		
12:45	0	1	14	36	0	1	12	32	0	2	26	68	
01:00	0		9		0		12		0		21		
01:15	0		9		0		13		0		22		
01:30	0		4		1		11		1		15		
01:45	0	0	7	29	0	1	8	44	0	1	15	73	
02:00	0		5		0		4		0		9		
02:15	0		10		1		6		1		16		
02:30	0		6		0		8		0		14		
02:45	1	1	2	23	0	1	12	30	1	2	14	53	
03:00	0		15		0		20		0		35		
03:15	0		8		0		9		0		17		
03:30	0		18		0		9		0		27		
03:45	0	0	12	53	0	0	14	52	0	0	26	105	
04:00	0		21		0		20		0		41		
04:15	0		13		0		14		0		27		
04:30	0		15		0		28		0		43		
04:45	0	0	12	61	0	0	18	80	0	0	30	141	
05:00	0		15		0		24		0		39		
05:15	1		14		0		13		1		27		
05:30	1		17		0		22		1		39		
05:45	2	4	14	60	2	2	12	71	4	6	26	131	
06:00	1		15		0		19		1		34		
06:15	3		18		2		5		5		23		
06:30	2		7		8		14		10		21		
06:45	7	13	8	48	10	20	10	48	17	33	18	96	
07:00	8		10		7		14		15		24		
07:15	7		5		12		10		19		15		
07:30	6		4		10		6		16		10		
07:45	5	26	1	20	14	43	6	36	19	69	7	56	
08:00	8		3		17		9		25		12		
08:15	8		3		14		4		22		7		
08:30	10		0		6		0		16		0		
08:45	18	44	3	9	12	49	1	14	30	93	4	23	
09:00	13		3		14		6		27		9		
09:15	7		4		16		1		23		5		
09:30	11		1		13		5		24		6		
09:45	12	43	2	10	11	54	1	13	23	97	3	23	
10:00	10		1		11		2		21		3		
10:15	12		1		4		2		16		3		
10:30	7		2		6		0		13		2		
10:45	10	39	0	4	7	28	1	5	17	67	1	9	
11:00	7		0		9		0		16		0		
11:15	7		1		5		0		12		1		
11:30	9		0		8		0		17		0		
11:45	9	32	0	1	12	34	1	1	21	66	1	2	
Total	203		354		233		426		436		780		
Percent	46.6%		45.4%		53.4%		54.6%						
Day Total		557				659				1216			
Peak	08:15	-	03:30	-	07:30	-	04:15	-	08:45	-	04:00	-	-	-
Vol.	49	-	64	-	55	-	84	-	104	-	141	-	-	-
P.H.F.	0.681		0.762		0.809		0.750		0.867		0.820			

Winch Street
east of Millwood Street
City, State: Framingham, MA
Client: GPI/ N. Rogers

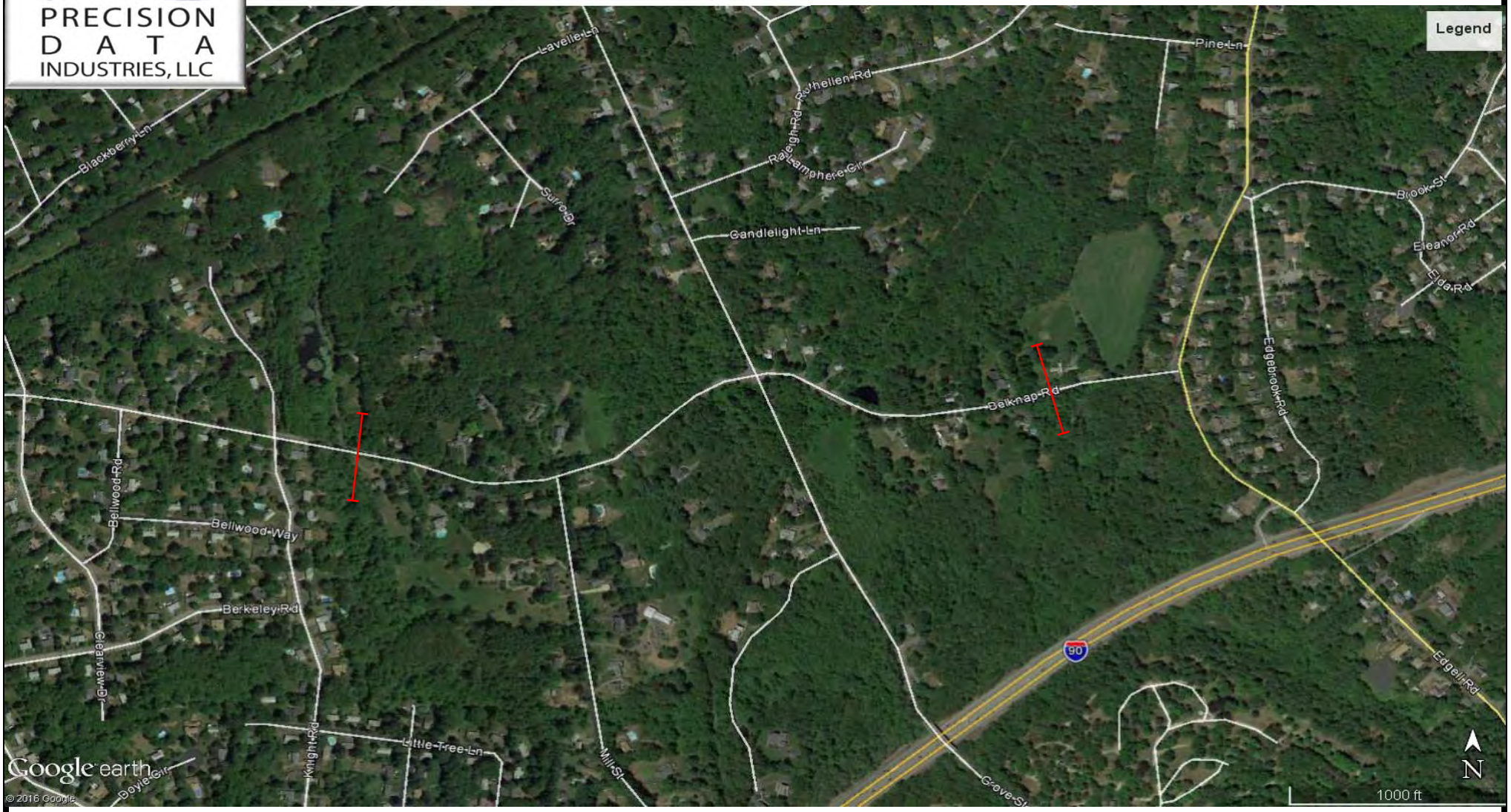
PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

165016 C VOLUME
Site Code: 2015047.05
Date Start: 29-Mar-16

Start	WB				EB				Combined				30-Mar-16
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	1		12		0		9		1		21		
12:15	2		3		0		5		2		8		
12:30	0		6		2		5		2		11		
12:45	0	3	7	28	0	2	11	30	0	5	18	58	
01:00	0		9		0		13		0		22		
01:15	0		10		1		12		1		22		
01:30	0		9		0		8		0		17		
01:45	0	0	7	35	0	1	15	48	0	1	22	83	
02:00	0		12		0		7		0		19		
02:15	0		6		0		11		0		17		
02:30	0		4		0		8		0		12		
02:45	0	0	10	32	0	0	9	35	0	0	19	67	
03:00	0		11		0		12		0		23		
03:15	0		10		0		8		0		18		
03:30	0		9		0		11		0		20		
03:45	0	0	16	46	1	1	8	39	1	1	24	85	
04:00	0		19		0		10		0		29		
04:15	0		19		0		12		0		31		
04:30	0		18		0		19		0		37		
04:45	0	0	11	67	0	0	15	56	0	0	26	123	
05:00	0		11		1		18		1		29		
05:15	1		9		2		18		3		27		
05:30	1		19		1		18		2		37		
05:45	1	3	12	51	0	4	20	74	1	7	32	125	
06:00	3		9		2		19		5		28		
06:15	1		8		2		15		3		23		
06:30	3		11		6		8		9		19		
06:45	7	14	14	42	8	18	18	60	15	32	32	102	
07:00	10		7		6		11		16		18		
07:15	7		3		10		6		17		9		
07:30	6		4		6		4		12		8		
07:45	4	27	3	17	15	37	10	31	19	64	13	48	
08:00	5		2		11		3		16		5		
08:15	5		2		17		4		22		6		
08:30	22		2		17		4		39		6		
08:45	19	51	2	8	14	59	5	16	33	110	7	24	
09:00	11		2		16		1		27		3		
09:15	8		0		16		1		24		1		
09:30	7		0		8		0		15		0		
09:45	5	31	1	3	7	47	1	3	12	78	2	6	
10:00	5		1		10		0		15		1		
10:15	7		1		14		0		21		1		
10:30	13		1		8		1		21		2		
10:45	6	31	2	5	8	40	2	3	14	71	4	8	
11:00	5		0		7		1		12		1		
11:15	9		1		5		0		14		1		
11:30	2		2		9		0		11		2		
11:45	7	23	0	3	6	27	0	1	13	50	0	4	
Total	183		337		236		396		419		733		
Percent	43.7%		46.0%		56.3%		54.0%						
Day Total		520				632				1152			
Peak	08:30	-	03:45	-	08:15	-	05:15	-	08:30	-	05:00	-	-	-
Vol.	60	-	72	-	64	-	75	-	123	-	125	-	-	-
P.H.F.	0.682		0.947		0.941		0.938		0.788		0.845			

PRECISION DATA INDUSTRIES, LLC
Office: 508.875.0100 Fax: 508.875.0118
Email: datarequests@pdillc.com

Traffic Counts with Precision



Client:	Engineer:	Site Code:	Date:	PDI Job Number:	City, State:
GPI	N. Rogers	MAX2015047.05	Wed 5/18 thru Thurs 5/19/16	165101	Framingham, MA

Belknap Road
east of Knight Road
City, State: Framingham, MA
Client: GPI/ N. Rogers

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

165101 A Volume
Site Code: MAX-2015047.05

Start	WB				EB				Combined				18-May-16
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	2		35		2		29		4		64		
12:15	1		29		0		38		1		67		
12:30	3		21		0		25		3		46		
12:45	2	8	28	113	0	2	27	119	2	10	55	232	
01:00	1		30		0		27		1		57		
01:15	0		33		1		25		1		58		
01:30	0		35		0		28		0		63		
01:45	0	1	26	124	1	2	35	115	1	3	61	239	
02:00	1		38		0		30		1		68		
02:15	0		42		0		41		0		83		
02:30	0		44		0		25		0		69		
02:45	0	1	52	176	0	0	36	132	0	1	88	308	
03:00	0		59		1		41		1		100		
03:15	0		64		0		33		0		97		
03:30	1		50		1		38		2		88		
03:45	0	1	80	253	0	2	47	159	0	3	127	412	
04:00	0		77		0		44		0		121		
04:15	2		92		0		35		2		127		
04:30	1		72		1		44		2		116		
04:45	1	4	64	305	2	3	32	155	3	7	96	460	
05:00	1		64		3		35		4		99		
05:15	5		73		7		58		12		131		
05:30	3		73		8		55		11		128		
05:45	9	18	66	276	15	33	36	184	24	51	102	460	
06:00	12		74		16		47		28		121		
06:15	17		54		25		41		42		95		
06:30	16		51		37		34		53		85		
06:45	23	68	37	216	71	149	41	163	94	217	78	379	
07:00	29		32		88		30		117		62		
07:15	41		30		91		18		132		48		
07:30	57		22		83		34		140		56		
07:45	56	183	19	103	65	327	15	97	121	510	34	200	
08:00	59		18		47		23		106		41		
08:15	75		24		52		19		127		43		
08:30	50		19		61		19		111		38		
08:45	50	234	15	76	48	208	8	69	98	442	23	145	
09:00	60		23		31		9		91		32		
09:15	30		10		27		8		57		18		
09:30	32		25		37		6		69		31		
09:45	30	152	17	75	31	126	6	29	61	278	23	104	
10:00	26		9		23		9		49		18		
10:15	14		5		30		1		44		6		
10:30	22		8		29		5		51		13		
10:45	31	93	3	25	24	106	3	18	55	199	6	43	
11:00	20		5		22		3		42		8		
11:15	18		4		29		4		47		8		
11:30	33		2		31		2		64		4		
11:45	34	105	2	13	26	108	6	15	60	213	8	28	
Total	868		1755		1066		1255		1934		3010		
Percent	44.9%		58.3%		55.1%		41.7%						
Day Total		2623				2321				4944			
Peak	07:30	-	03:45	-	06:45	-	05:15	-	07:00	-	03:45	-	-	-
Vol.	247	-	321	-	333	-	196	-	510	-	491	-	-	-
P.H.F.	0.823		0.872		0.915		0.845		0.911		0.967			

Belknap Road
east of Knight Road
City, State: Framingham, MA
Client: GPI/ N. Rogers

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

165101 A Volume
Site Code: MAX-2015047.05

Start	WB				EB				Combined				19-May-16
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Thu
12:00	4		35		0		23		4		58		
12:15	0		25		1		24		1		49		
12:30	1		24		1		37		2		61		
12:45	1	6	36	120	6	8	40	124	7	14	76	244	
01:00	3		26		0		20		3		46		
01:15	2		26		0		24		2		50		
01:30	0		38		0		33		0		71		
01:45	0	5	28	118	0	0	37	114	0	5	65	232	
02:00	0		39		0		34		0		73		
02:15	1		47		0		25		1		72		
02:30	0		47		0		24		0		71		
02:45	0	1	50	183	0	0	32	115	0	1	82	298	
03:00	0		51		0		22		0		73		
03:15	0		63		0		25		0		88		
03:30	1		63		0		37		1		100		
03:45	0	1	66	243	1	1	35	119	1	2	101	362	
04:00	1		68		0		29		1		97		
04:15	2		76		1		37		3		113		
04:30	1		81		0		53		1		134		
04:45	0	4	60	285	3	4	34	153	3	8	94	438	
05:00	1		61		2		64		3		125		
05:15	3		72		5		62		8		134		
05:30	2		72		11		51		13		123		
05:45	11	17	74	279	16	34	48	225	27	51	122	504	
06:00	11		79		15		36		26		115		
06:15	14		59		24		38		38		97		
06:30	24		55		37		28		61		83		
06:45	21	70	36	229	61	137	30	132	82	207	66	361	
07:00	21		46		96		27		117		73		
07:15	40		37		74		19		114		56		
07:30	60		28		73		19		133		47		
07:45	48	169	29	140	80	323	26	91	128	492	55	231	
08:00	68		34		43		21		111		55		
08:15	57		23		47		23		104		46		
08:30	56		22		51		28		107		50		
08:45	60	241	16	95	49	190	5	77	109	431	21	172	
09:00	46		17		44		7		90		24		
09:15	41		7		32		14		73		21		
09:30	20		13		41		8		61		21		
09:45	27	134	13	50	38	155	13	42	65	289	26	92	
10:00	32		7		30		7		62		14		
10:15	19		8		21		2		40		10		
10:30	25		7		21		6		46		13		
10:45	14	90	2	24	28	100	4	19	42	190	6	43	
11:00	23		6		28		7		51		13		
11:15	31		4		30		4		61		8		
11:30	20		5		24		1		44		6		
11:45	31	105	2	17	37	119	3	15	68	224	5	32	
Total	843		1783		1071		1226		1914		3009		
Percent	44.0%		59.3%		56.0%		40.7%						
Day Total		2626				2297				4923			
Peak	08:00	-	05:15	-	07:00	-	05:00	-	07:00	-	05:00	-	-	-
Vol.	241	-	297	-	323	-	225	-	492	-	504	-	-	-
P.H.F.	0.886		0.917		0.841		0.879		0.925		0.940			

PRECISION
D A T A
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Belknap Road
east of Knight Road
City, State: Framingham, MA
Client: GPI/ N. Rogers

165101 A Class
Site Code: MAX-2015047.05

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/18/1														
6	0	8	0	0	0	0	0	0	0	0	0	0	0	8
01:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
05:00	0	14	4	0	0	0	0	0	0	0	0	0	0	18
06:00	1	50	11	1	4	0	0	1	0	0	0	0	0	68
07:00	3	146	24	3	6	0	0	0	1	0	0	0	0	183
08:00	0	185	37	2	9	0	0	0	1	0	0	0	0	234
09:00	1	117	27	0	7	0	0	0	0	0	0	0	0	152
10:00	3	62	21	1	5	0	0	1	0	0	0	0	0	93
11:00	1	76	18	0	8	0	0	1	1	0	0	0	0	105
12 PM	1	78	22	0	12	0	0	0	0	0	0	0	0	113
13:00	2	91	23	0	8	0	0	0	0	0	0	0	0	124
14:00	3	118	43	5	6	1	0	0	0	0	0	0	0	176
15:00	2	187	49	1	12	1	0	1	0	0	0	0	0	253
16:00	4	230	53	2	15	0	0	1	0	0	0	0	0	305
17:00	5	222	36	1	10	0	0	2	0	0	0	0	0	276
18:00	3	167	35	0	10	1	0	0	0	0	0	0	0	216
19:00	1	82	14	0	6	0	0	0	0	0	0	0	0	103
20:00	1	60	14	0	1	0	0	0	0	0	0	0	0	76
21:00	0	63	12	0	0	0	0	0	0	0	0	0	0	75
22:00	0	25	0	0	0	0	0	0	0	0	0	0	0	25
23:00	0	12	0	0	1	0	0	0	0	0	0	0	0	13
Total	31	1999	444	16	120	3	0	7	3	0	0	0	0	2623
Percent	1.2%	76.2%	16.9%	0.6%	4.6%	0.1%	0.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	08:00	08:00	07:00	08:00			06:00	07:00					08:00
Vol.	3	185	37	3	9			1	1					234
PM Peak	17:00	16:00	16:00	14:00	16:00	14:00		17:00						16:00
Vol.	5	230	53	5	15	1		2						305

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Belknap Road
east of Knight Road
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165101 A Class
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WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/19/1														
6	0	6	0	0	0	0	0	0	0	0	0	0	0	6
01:00	0	4	0	0	1	0	0	0	0	0	0	0	0	5
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
05:00	0	11	6	0	0	0	0	0	0	0	0	0	0	17
06:00	1	49	15	0	5	0	0	0	0	0	0	0	0	70
07:00	2	133	23	3	8	0	0	0	0	0	0	0	0	169
08:00	6	185	36	3	10	1	0	0	0	0	0	0	0	241
09:00	0	94	28	1	11	0	0	0	0	0	0	0	0	134
10:00	0	69	16	0	5	0	0	0	0	0	0	0	0	90
11:00	1	72	23	3	6	0	0	0	0	0	0	0	0	105
12 PM	1	91	22	0	5	1	0	0	0	0	0	0	0	120
13:00	1	84	29	1	3	0	0	0	0	0	0	0	0	118
14:00	0	133	40	4	6	0	0	0	0	0	0	0	0	183
15:00	2	189	38	1	10	1	0	2	0	0	0	0	0	243
16:00	4	232	37	1	9	0	0	2	0	0	0	0	0	285
17:00	5	219	44	0	11	0	0	0	0	0	0	0	0	279
18:00	4	190	26	0	9	0	0	0	0	0	0	0	0	229
19:00	1	103	29	0	7	0	0	0	0	0	0	0	0	140
20:00	0	80	14	0	1	0	0	0	0	0	0	0	0	95
21:00	0	43	6	0	1	0	0	0	0	0	0	0	0	50
22:00	0	22	1	0	1	0	0	0	0	0	0	0	0	24
23:00	0	14	3	0	0	0	0	0	0	0	0	0	0	17
Total	28	2029	436	17	109	3	0	4	0	0	0	0	0	2626
Percent	1.1%	77.3%	16.6%	0.6%	4.2%	0.1%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	08:00	08:00	07:00	09:00	08:00								08:00
Vol.	6	185	36	3	11	1								241
PM Peak	17:00	16:00	17:00	14:00	17:00	12:00		15:00						16:00
Vol.	5	232	44	4	11	1		2						285

PRECISION
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Belknap Road
east of Knight Road
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165101 A Class
Site Code: MAX-2015047.05

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/18/1														
6	0	2	0	0	0	0	0	0	0	0	0	0	0	2
01:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
04:00	0	2	1	0	0	0	0	0	0	0	0	0	0	3
05:00	0	26	7	0	0	0	0	0	0	0	0	0	0	33
06:00	2	119	20	3	5	0	0	0	0	0	0	0	0	149
07:00	5	265	47	1	8	0	0	0	1	0	0	0	0	327
08:00	0	168	29	2	8	0	0	1	0	0	0	0	0	208
09:00	0	93	27	0	6	0	0	0	0	0	0	0	0	126
10:00	3	72	17	0	11	0	0	2	1	0	0	0	0	106
11:00	1	88	14	1	4	0	0	0	0	0	0	0	0	108
12 PM	2	83	31	0	3	0	0	0	0	0	0	0	0	119
13:00	0	89	19	0	7	0	0	0	0	0	0	0	0	115
14:00	1	104	22	2	2	0	0	1	0	0	0	0	0	132
15:00	3	117	30	2	7	0	0	0	0	0	0	0	0	159
16:00	1	112	33	0	6	1	0	1	1	0	0	0	0	155
17:00	3	149	32	0	0	0	0	0	0	0	0	0	0	184
18:00	1	140	14	0	8	0	0	0	0	0	0	0	0	163
19:00	0	79	16	0	2	0	0	0	0	0	0	0	0	97
20:00	0	58	10	0	1	0	0	0	0	0	0	0	0	69
21:00	0	23	6	0	0	0	0	0	0	0	0	0	0	29
22:00	0	16	1	0	1	0	0	0	0	0	0	0	0	18
23:00	0	9	5	0	1	0	0	0	0	0	0	0	0	15
Total	22	1818	381	11	80	1	0	5	3	0	0	0	0	2321
Percent	0.9%	78.3%	16.4%	0.5%	3.4%	0.0%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	07:00	06:00	10:00			10:00	07:00					07:00
Vol.	5	265	47	3	11			2	1					327
PM Peak	15:00	17:00	16:00	14:00	18:00	16:00		14:00	16:00					17:00
Vol.	3	149	33	2	8	1		1	1					184

Belknap Road
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165101 A Class
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EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/19/1														
6	0	8	0	0	0	0	0	0	0	0	0	0	0	8
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
05:00	0	27	6	0	1	0	0	0	0	0	0	0	0	34
06:00	1	113	16	2	5	0	0	0	0	0	0	0	0	137
07:00	4	259	45	2	12	1	0	0	0	0	0	0	0	323
08:00	2	150	29	2	7	0	0	0	0	0	0	0	0	190
09:00	0	115	31	0	9	0	0	0	0	0	0	0	0	155
10:00	0	76	16	0	7	1	0	0	0	0	0	0	0	100
11:00	2	93	17	1	5	0	0	1	0	0	0	0	0	119
12 PM	0	88	25	1	9	1	0	0	0	0	0	0	0	124
13:00	0	80	23	2	9	0	0	0	0	0	0	0	0	114
14:00	2	88	22	0	2	0	0	1	0	0	0	0	0	115
15:00	0	85	26	0	8	0	0	0	0	0	0	0	0	119
16:00	2	109	37	0	4	1	0	0	0	0	0	0	0	153
17:00	1	187	32	0	5	0	0	0	0	0	0	0	0	225
18:00	2	115	11	0	4	0	0	0	0	0	0	0	0	132
19:00	0	79	11	0	1	0	0	0	0	0	0	0	0	91
20:00	0	61	14	0	1	0	0	1	0	0	0	0	0	77
21:00	0	39	3	0	0	0	0	0	0	0	0	0	0	42
22:00	0	14	5	0	0	0	0	0	0	0	0	0	0	19
23:00	0	15	0	0	0	0	0	0	0	0	0	0	0	15
Total	16	1805	370	10	89	4	0	3	0	0	0	0	0	2297
Percent	0.7%	78.6%	16.1%	0.4%	3.9%	0.2%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	07:00	06:00	07:00	07:00		11:00						07:00
Vol.	4	259	45	2	12	1		1						323
PM Peak	14:00	17:00	16:00	13:00	12:00	12:00		14:00						17:00
Vol.	2	187	37	2	9	1		1						225

PRECISION
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Belknap Road
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165101 A Speed
Site Code: MAX-2015047.05

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
05/18/ 16	0	0	0	0	3	1	3	1	0	0	0	0	0	8	43	38
01:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1	38	37
02:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1	33	32
03:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1	33	32
04:00	0	0	0	1	1	2	0	0	0	0	0	0	0	4	37	33
05:00	0	0	0	2	8	2	5	1	0	0	0	0	0	18	42	36
06:00	1	0	3	7	21	27	9	0	0	0	0	0	0	68	38	34
07:00	**3**	2	3	27	71	59	**17**	1	0	0	0	0	0	183	38	33
08:00	0	0	5	**28**	**109**	**78**	13	0	**1**	0	0	0	0	**234**	37	33
09:00	1	**4**	2	28	47	52	16	**2**	0	0	0	0	0	152	38	33
10:00	1	1	4	24	39	18	6	0	0	0	0	0	0	93	36	31
11:00	0	0	**6**	24	37	31	4	2	1	0	0	0	0	105	37	33
12 PM	1	1	0	19	49	33	8	2	0	0	0	0	0	113	37	33
13:00	2	0	2	27	54	30	7	2	0	0	0	0	0	124	37	32
14:00	**3**	**4**	**13**	32	61	51	12	0	0	0	0	0	0	176	37	32
15:00	0	0	0	31	100	97	25	0	0	0	0	0	0	253	38	34
16:00	3	0	4	23	**144**	96	33	1	**1**	0	0	0	0	**305**	38	34
17:00	0	1	3	21	111	**98**	**39**	**3**	0	0	0	0	0	276	39	35
18:00	0	0	5	**33**	92	68	15	2	1	0	0	0	0	216	37	34
19:00	0	1	2	7	35	41	17	0	0	0	0	0	0	103	39	35
20:00	0	1	0	8	35	26	4	2	0	0	0	0	0	76	37	34
21:00	0	0	0	20	36	16	3	0	0	0	0	0	0	75	36	32
22:00	0	0	0	1	7	11	5	1	0	0	0	0	0	25	41	37
23:00	0	0	0	3	5	4	1	0	0	0	0	0	0	13	37	33
Total	15	15	52	366	1067	842	242	20	4	0	0	0	0	2623		
%	0.6%	0.6%	2.0%	14.0%	40.7%	32.1%	9.2%	0.8%	0.2%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	09:00	11:00	08:00	08:00	08:00	07:00	09:00	08:00					08:00		
Vol.	3	4	6	28	109	78	17	2	1					234		
PM Peak	14:00	14:00	14:00	18:00	16:00	17:00	17:00	17:00	16:00					16:00		
Vol.	3	4	13	33	144	98	39	3	1					305		

Stats

15th Percentile :	28 MPH
50th Percentile :	33 MPH
85th Percentile :	38 MPH
95th Percentile :	41 MPH
Mean Speed(Average) :	34 MPH
10 MPH Pace Speed :	30-39 MPH
Number in Pace :	1909
Percent in Pace :	72.8%
Number of Vehicles > 35 MPH :	940
Percent of Vehicles > 35 MPH :	35.8%

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Belknap Road
east of Knight Road
City, State: Framingham, MA
Client: GPI/ N. Rogers

165101 A Speed
Site Code: MAX-2015047.05

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
05/19/ 16	0	0	0	1	0	2	1	2	0	0	0	0	0	6	46	39
01:00	0	0	0	0	0	2	2	0	**1**	0	0	0	0	5	50	42
02:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1	33	32
03:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1	33	32
04:00	0	0	0	1	2	1	0	0	0	0	0	0	0	4	36	32
05:00	0	0	0	2	8	6	1	0	0	0	0	0	0	17	37	34
06:00	0	0	0	16	24	22	8	0	0	0	0	0	0	70	38	34
07:00	2	**2**	2	16	71	60	**14**	1	0	0	0	0	**1**	169	38	34
08:00	**4**	0	**3**	**33**	**112**	**73**	14	1	0	**1**	0	0	0	**241**	37	33
09:00	0	1	3	13	60	49	6	1	1	0	0	0	0	134	37	34
10:00	0	0	2	15	27	36	8	2	0	0	0	0	0	90	38	34
11:00	0	0	2	18	41	31	9	**4**	0	0	0	0	0	105	38	34
12 PM	1	0	4	13	45	51	4	2	0	0	0	0	0	120	37	34
13:00	0	**1**	1	26	46	37	6	1	0	0	0	0	0	118	37	33
14:00	0	0	1	31	59	77	14	0	0	**1**	0	0	0	183	38	34
15:00	0	1	5	31	106	82	18	0	0	0	0	0	0	243	37	34
16:00	2	0	**12**	**40**	**113**	93	21	**4**	0	0	0	0	0	**285**	38	33
17:00	**5**	0	0	25	103	**127**	18	1	0	0	0	0	0	279	38	34
18:00	3	1	3	34	97	64	**24**	2	**1**	0	0	0	0	229	38	33
19:00	0	1	2	14	61	47	13	2	0	0	0	0	0	140	38	34
20:00	0	0	7	19	37	27	4	1	0	0	0	0	0	95	37	32
21:00	0	0	0	13	21	9	4	2	1	0	0	0	0	50	38	33
22:00	0	0	0	6	12	5	1	0	0	0	0	0	0	24	36	32
23:00	0	0	0	4	5	8	0	0	0	0	0	0	0	17	37	33
Total	17	7	47	371	1052	909	190	26	4	2	0	0	1	2626		
%	0.6%	0.3%	1.8%	14.1%	40.1%	34.6%	7.2%	1.0%	0.2%	0.1%	0.0%	0.0%	0.0%			
AM Peak	08:00	07:00	08:00	08:00	08:00	08:00	07:00	11:00	01:00	08:00			07:00	08:00		
Vol.	4	2	3	33	112	73	14	4	1	1			1	241		
PM Peak	17:00	13:00	16:00	16:00	16:00	17:00	18:00	16:00	18:00	14:00				16:00		
Vol.	5	1	12	40	113	127	24	4	1	1				285		

Stats

15th Percentile :	28 MPH
50th Percentile :	33 MPH
85th Percentile :	38 MPH
95th Percentile :	41 MPH
Mean Speed(Average) :	34 MPH
10 MPH Pace Speed :	30-39 MPH
Number in Pace :	1961
Percent in Pace :	74.7%
Number of Vehicles > 35 MPH :	950
Percent of Vehicles > 35 MPH :	36.2%

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Belknap Road
east of Knight Road
City, State: Framingham, MA
Client: GPI/ N. Rogers

165101 A Speed
Site Code: MAX-2015047.05

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
05/18/ 16	0	0	0	0	1	1	0	0	0	0	0	0	0	2	37	35
01:00	0	0	0	0	1	1	0	0	0	0	0	0	0	2	37	35
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	1	0	1	0	0	0	0	0	0	0	2	37	32
04:00	0	0	0	2	1	0	0	0	0	0	0	0	0	3	31	29
05:00	0	0	1	3	12	14	1	**2**	0	0	0	0	0	33	38	35
06:00	0	0	1	20	51	64	13	0	0	0	0	0	0	149	38	34
07:00	**2**	1	5	**26**	**118**	**142**	**32**	1	0	0	0	0	0	**327**	38	34
08:00	0	0	6	18	83	81	18	2	0	0	0	0	0	208	38	34
09:00	1	**2**	2	23	61	30	7	0	0	0	0	0	0	126	37	32
10:00	2	1	**13**	24	33	27	5	1	0	0	0	0	0	106	37	31
11:00	0	1	6	16	47	32	5	1	0	0	0	0	0	108	37	33
12 PM	0	**1**	2	17	45	39	13	2	0	0	0	0	0	119	38	34
13:00	0	0	6	**23**	46	31	9	0	0	0	0	0	0	115	37	33
14:00	1	0	3	20	57	44	6	1	0	0	0	0	0	132	37	33
15:00	**3**	0	3	21	**84**	40	7	1	0	0	0	0	0	159	37	32
16:00	0	0	**7**	17	59	62	7	3	0	0	0	0	0	155	37	34
17:00	1	0	3	16	70	66	**24**	3	**1**	0	0	0	0	**184**	39	35
18:00	1	1	1	13	59	**72**	13	3	0	0	0	0	0	163	38	35
19:00	0	0	1	15	30	40	7	**4**	0	0	0	0	0	97	38	35
20:00	0	0	1	16	21	26	4	0	1	0	0	0	0	69	37	33
21:00	0	0	1	4	9	11	3	0	1	0	0	0	0	29	38	35
22:00	0	1	0	2	11	0	3	1	0	0	0	0	0	18	41	33
23:00	0	0	1	1	1	9	2	1	0	0	0	0	0	15	40	36
Total	11	8	63	298	900	833	179	26	3	0	0	0	0	2321		
%	0.5%	0.3%	2.7%	12.8%	38.8%	35.9%	7.7%	1.1%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	09:00	10:00	07:00	07:00	07:00	07:00	05:00						07:00		
Vol.	2	2	13	26	118	142	32	2						327		
PM Peak	15:00	12:00	16:00	13:00	15:00	18:00	17:00	19:00	17:00					17:00		
Vol.	3	1	7	23	84	72	24	4	1					184		

Stats

15th Percentile :	28 MPH
50th Percentile :	33 MPH
85th Percentile :	38 MPH
95th Percentile :	41 MPH
Mean Speed(Average) :	34 MPH
10 MPH Pace Speed :	30-39 MPH
Number in Pace :	1733
Percent in Pace :	74.7%
Number of Vehicles > 35 MPH :	874
Percent of Vehicles > 35 MPH :	37.7%

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
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Belknap Road
east of Knight Road
City, State: Framingham, MA
Client: GPI/ N. Rogers

165101 A Speed
Site Code: MAX-2015047.05

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
05/19/ 16	0	0	0	0	2	5	1	0	0	0	0	0	0	8	38	36
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1	33	32
04:00	0	0	0	1	2	0	0	1	0	0	0	0	0	4	46	34
05:00	0	**1**	1	6	10	13	3	0	0	0	0	0	0	34	38	33
06:00	0	0	5	14	54	53	11	0	0	0	0	0	0	137	38	34
07:00	**2**	0	5	25	**138**	**118**	**32**	3	0	0	0	0	0	**323**	38	34
08:00	1	0	3	**26**	85	60	13	2	0	0	0	0	0	190	37	33
09:00	0	0	**6**	16	61	57	11	**4**	0	0	0	0	0	155	38	34
10:00	0	0	2	13	44	35	5	1	0	0	0	0	0	100	37	34
11:00	1	1	3	14	49	41	9	0	**1**	0	0	0	0	119	38	33
12 PM	0	**1**	4	14	33	58	11	**3**	0	0	0	0	0	124	38	35
13:00	0	1	6	14	39	43	9	2	0	0	0	0	0	114	38	34
14:00	1	0	7	21	34	37	12	2	**1**	0	0	0	0	115	38	33
15:00	1	0	5	18	41	45	9	0	0	0	0	0	0	119	38	33
16:00	**2**	0	8	10	61	60	10	2	0	0	0	0	0	153	38	34
17:00	1	0	**10**	**23**	**83**	**89**	**17**	2	0	0	0	0	0	**225**	38	34
18:00	2	0	1	14	48	57	9	1	0	0	0	0	0	132	38	34
19:00	0	0	2	12	31	37	8	0	1	0	0	0	0	91	38	34
20:00	0	0	2	12	35	26	2	0	0	0	0	0	0	77	37	33
21:00	0	0	2	5	12	20	3	0	0	0	0	0	0	42	38	34
22:00	0	0	0	5	4	4	3	2	1	0	0	0	0	19	44	36
23:00	0	0	1	4	5	4	1	0	0	0	0	0	0	15	37	32
Total	11	4	73	267	872	862	179	25	4	0	0	0	0	2297		
%	0.5%	0.2%	3.2%	11.6%	38.0%	37.5%	7.8%	1.1%	0.2%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	05:00	09:00	08:00	07:00	07:00	07:00	09:00	11:00					07:00		
Vol.	2	1	6	26	138	118	32	4	1					323		
PM Peak	16:00	12:00	17:00	17:00	17:00	17:00	17:00	12:00	14:00					17:00		
Vol.	2	1	10	23	83	89	17	3	1					225		

Stats

15th Percentile :	28 MPH
50th Percentile :	33 MPH
85th Percentile :	38 MPH
95th Percentile :	41 MPH
Mean Speed(Average) :	34 MPH
10 MPH Pace Speed :	30-39 MPH
Number in Pace :	1734
Percent in Pace :	75.5%
Number of Vehicles > 35 MPH :	898
Percent of Vehicles > 35 MPH :	39.1%

Belknap Road
west of Edgell Road
City, State: Framingham, MA
Client: GPI/ N. Rogers

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

165101 B Volume
Site Code: MAX-2015047.05

Start	EB				WB				Combined				18-May-16
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	4		44		4		38		8		82		
12:15	1		53		3		43		4		96		
12:30	1		38		6		33		7		71		
12:45	0	6	41	176	0	13	43	157	0	19	84	333	
01:00	0		35		2		48		2		83		
01:15	0		43		0		40		0		83		
01:30	0		39		1		48		1		87		
01:45	1	1	49	166	0	3	30	166	1	4	79	332	
02:00	0		43		3		59		3		102		
02:15	0		58		2		63		2		121		
02:30	1		36		1		85		2		121		
02:45	2	3	55	192	0	6	64	271	2	9	119	463	
03:00	1		58		1		80		2		138		
03:15	0		58		0		96		0		154		
03:30	2		57		1		79		3		136		
03:45	0	3	56	229	0	2	123	378	0	5	179	607	
04:00	1		62		1		112		2		174		
04:15	1		51		2		129		3		180		
04:30	2		60		0		92		2		152		
04:45	3	7	54	227	1	4	92	425	4	11	146	652	
05:00	4		56		2		105		6		161		
05:15	12		69		6		102		18		171		
05:30	11		42		4		112		15		154		
05:45	17	44	57	224	14	26	85	404	31	70	142	628	
06:00	29		67		12		106		41		173		
06:15	40		53		19		91		59		144		
06:30	60		40		15		67		75		107		
06:45	97	226	62	222	26	72	72	336	123	298	134	558	
07:00	130		41		32		61		162		102		
07:15	121		31		49		45		170		76		
07:30	117		36		60		45		177		81		
07:45	103	471	26	134	59	200	30	181	162	671	56	315	
08:00	84		32		71		42		155		74		
08:15	100		19		95		37		195		56		
08:30	99		15		64		27		163		42		
08:45	99	382	14	80	60	290	33	139	159	672	47	219	
09:00	57		20		65		35		122		55		
09:15	59		17		43		27		102		44		
09:30	63		16		53		28		116		44		
09:45	61	240	9	62	39	200	23	113	100	440	32	175	
10:00	30		12		41		15		71		27		
10:15	44		3		27		10		71		13		
10:30	47		3		35		8		82		11		
10:45	38	159	7	25	36	139	7	40	74	298	14	65	
11:00	43		3		33		10		76		13		
11:15	55		6		26		6		81		12		
11:30	48		4		41		5		89		9		
11:45	42	188	7	20	41	141	2	23	83	329	9	43	
Total	1730		1757		1096		2633		2826		4390		
Percent	61.2%		40.0%		38.8%		60.0%						
Day Total		3487				3729				7216			
Peak	07:00	-	04:30	-	08:00	-	03:45	-	07:30	-	03:45	-	- -
Vol.	471	-	239	-	290	-	456	-	689	-	685	-	- -
P.H.F.	0.906		0.866		0.763		0.884		0.883		0.951		

Belknap Road
west of Edgell Road
City, State: Framingham, MA
Client: GPI/ N. Rogers

PRECISION DATA INDUSTRIES, LLC
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165101 B Volume
Site Code: MAX-2015047.05

Start	EB				WB				Combined				19-May-16
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Thu
12:00	0		38		4		50		4		88		
12:15	2		39		3		39		5		78		
12:30	2		48		0		38		2		86		
12:45	6	10	67	192	1	8	44	171	7	18	111	363	
01:00	2		41		3		47		5		88		
01:15	0		42		0		56		0		98		
01:30	0		47		1		50		1		97		
01:45	0	2	51	181	0	4	31	184	0	6	82	365	
02:00	0		45		0		64		0		109		
02:15	0		43		1		63		1		106		
02:30	0		43		0		73		0		116		
02:45	1	1	46	177	0	1	82	282	1	2	128	459	
03:00	0		40		0		79		0		119		
03:15	0		44		0		92		0		136		
03:30	0		61		1		90		1		151		
03:45	2	2	58	203	0	1	111	372	2	3	169	575	
04:00	0		53		1		96		1		149		
04:15	2		61		1		118		3		179		
04:30	2		69		1		115		3		184		
04:45	3	7	50	233	0	3	99	428	3	10	149	661	
05:00	5		74		1		87		6		161		
05:15	12		74		6		108		18		182		
05:30	13		67		1		97		14		164		
05:45	22	52	69	284	11	19	120	412	33	71	189	696	
06:00	27		45		13		113		40		158		
06:15	34		64		16		72		50		136		
06:30	63		48		29		84		92		132		
06:45	86	210	42	199	33	91	66	335	119	301	108	534	
07:00	134		44		32		75		166		119		
07:15	120		39		54		43		174		82		
07:30	94		25		64		46		158		71		
07:45	100	448	30	138	49	199	55	219	149	647	85	357	
08:00	79		27		89		35		168		62		
08:15	84		27		69		35		153		62		
08:30	85		30		60		33		145		63		
08:45	90	338	13	97	66	284	29	132	156	622	42	229	
09:00	73		10		55		23		128		33		
09:15	66		16		46		23		112		39		
09:30	63		13		35		22		98		35		
09:45	56	258	14	53	35	171	16	84	91	429	30	137	
10:00	41		7		33		16		74		23		
10:15	37		5		30		10		67		15		
10:30	45		9		31		9		76		18		
10:45	41	164	10	31	31	125	6	41	72	289	16	72	
11:00	36		8		29		7		65		15		
11:15	63		5		38		10		101		15		
11:30	41		2		37		4		78		6		
11:45	58	198	3	18	43	147	6	27	101	345	9	45	
Total	1690		1806		1053		2687		2743		4493		
Percent	61.6%		40.2%		38.4%		59.8%						
Day Total		3496				3740				7236			
Peak	07:00	-	05:00	-	08:00	-	03:45	-	07:15	-	05:00	-	- -
Vol.	448	-	284	-	284	-	440	-	649	-	696	-	- -
P.H.F.	0.836		0.959		0.798		0.932		0.932		0.921		

Belknap Road
west of Edgell Road
City, State: Framingham, MA
Client: GPI/ N. Rogers

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

165101 B Class
Site Code: MAX-2015047.05

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/18/1														
6	0	6	0	0	0	0	0	0	0	0	0	0	0	6
01:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
02:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
03:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
04:00	0	6	1	0	0	0	0	0	0	0	0	0	0	7
05:00	0	35	8	0	1	0	0	0	0	0	0	0	0	44
06:00	3	181	38	2	2	0	0	0	0	0	0	0	0	226
07:00	8	413	40	1	8	0	0	0	1	0	0	0	0	471
08:00	4	332	34	1	8	2	0	1	0	0	0	0	0	382
09:00	1	200	28	1	7	2	0	1	0	0	0	0	0	240
10:00	2	117	31	0	7	0	0	1	1	0	0	0	0	159
11:00	0	161	16	1	10	0	0	0	0	0	0	0	0	188
12 PM	2	139	28	0	6	1	0	0	0	0	0	0	0	176
13:00	1	138	17	0	9	1	0	0	0	0	0	0	0	166
14:00	0	163	19	4	4	1	0	1	0	0	0	0	0	192
15:00	3	190	28	2	6	0	0	0	0	0	0	0	0	229
16:00	2	183	31	0	8	1	0	1	1	0	0	0	0	227
17:00	8	203	12	0	0	1	0	0	0	0	0	0	0	224
18:00	5	191	23	0	2	1	0	0	0	0	0	0	0	222
19:00	1	113	18	0	1	1	0	0	0	0	0	0	0	134
20:00	1	71	7	0	1	0	0	0	0	0	0	0	0	80
21:00	0	53	8	0	1	0	0	0	0	0	0	0	0	62
22:00	0	23	1	0	1	0	0	0	0	0	0	0	0	25
23:00	0	15	5	0	0	0	0	0	0	0	0	0	0	20
Total	41	2940	393	12	82	11	0	5	3	0	0	0	0	3487
Percent	1.2%	84.3%	11.3%	0.3%	2.4%	0.3%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	07:00	06:00	11:00	08:00		08:00	07:00					07:00
Vol.	8	413	40	2	10	2		1	1					471
PM Peak	17:00	17:00	16:00	14:00	13:00	12:00		14:00	16:00					15:00
Vol.	8	203	31	4	9	1		1	1					229

Belknap Road
west of Edgell Road
City, State: Framingham, MA
Client: GPI/ N. Rogers

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

165101 B Class
Site Code: MAX-2015047.05

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/19/1														
6	0	9	0	1	0	0	0	0	0	0	0	0	0	10
01:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
04:00	0	5	1	0	1	0	0	0	0	0	0	0	0	7
05:00	1	45	5	0	1	0	0	0	0	0	0	0	0	52
06:00	2	177	26	1	4	0	0	0	0	0	0	0	0	210
07:00	4	399	37	3	4	1	0	0	0	0	0	0	0	448
08:00	5	287	41	0	4	1	0	0	0	0	0	0	0	338
09:00	1	217	34	0	6	0	0	0	0	0	0	0	0	258
10:00	0	144	14	0	4	1	0	1	0	0	0	0	0	164
11:00	2	166	21	3	4	1	0	1	0	0	0	0	0	198
12 PM	0	160	23	1	6	2	0	0	0	0	0	0	0	192
13:00	2	143	30	3	3	0	0	0	0	0	0	0	0	181
14:00	2	149	19	0	7	0	0	0	0	0	0	0	0	177
15:00	3	167	28	0	4	0	0	1	0	0	0	0	0	203
16:00	7	183	36	0	7	0	0	0	0	0	0	0	0	233
17:00	3	254	23	0	2	2	0	0	0	0	0	0	0	284
18:00	5	177	16	0	1	0	0	0	0	0	0	0	0	199
19:00	3	120	12	1	2	0	0	0	0	0	0	0	0	138
20:00	1	85	10	0	0	0	0	1	0	0	0	0	0	97
21:00	0	49	4	0	0	0	0	0	0	0	0	0	0	53
22:00	0	28	2	0	1	0	0	0	0	0	0	0	0	31
23:00	0	18	0	0	0	0	0	0	0	0	0	0	0	18
Total	41	2987	382	13	61	8	0	4	0	0	0	0	0	3496
Percent	1.2%	85.4%	10.9%	0.4%	1.7%	0.2%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	07:00	08:00	07:00	09:00	07:00		10:00						07:00
Vol.	5	399	41	3	6	1		1						448
PM Peak	16:00	17:00	16:00	13:00	14:00	12:00		15:00						17:00
Vol.	7	254	36	3	7	2		1						284

PRECISION
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Belknap Road
west of Edgell Road
City, State: Framingham, MA
Client: GPI/ N. Rogers

165101 B Class
Site Code: MAX-2015047.05

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/18/1														
6	0	13	0	0	0	0	0	0	0	0	0	0	0	13
01:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
02:00	0	5	0	0	1	0	0	0	0	0	0	0	0	6
03:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
04:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
05:00	0	21	5	0	0	0	0	0	0	0	0	0	0	26
06:00	1	57	10	0	4	0	0	0	0	0	0	0	0	72
07:00	3	167	24	1	3	1	0	0	1	0	0	0	0	200
08:00	5	252	24	2	5	1	0	0	1	0	0	0	0	290
09:00	3	163	28	1	4	1	0	0	0	0	0	0	0	200
10:00	2	103	23	1	9	0	0	1	0	0	0	0	0	139
11:00	2	114	20	0	4	0	0	0	1	0	0	0	0	141
12 PM	1	124	23	1	8	0	0	0	0	0	0	0	0	157
13:00	0	137	24	0	4	1	0	0	0	0	0	0	0	166
14:00	1	213	42	6	6	1	0	2	0	0	0	0	0	271
15:00	3	312	49	1	12	0	0	1	0	0	0	0	0	378
16:00	2	354	59	2	5	1	0	2	0	0	0	0	0	425
17:00	8	348	39	1	6	1	0	1	0	0	0	0	0	404
18:00	7	283	42	0	4	0	0	0	0	0	0	0	0	336
19:00	2	161	16	0	2	0	0	0	0	0	0	0	0	181
20:00	3	125	10	0	1	0	0	0	0	0	0	0	0	139
21:00	0	101	11	0	1	0	0	0	0	0	0	0	0	113
22:00	0	38	2	0	0	0	0	0	0	0	0	0	0	40
23:00	0	21	2	0	0	0	0	0	0	0	0	0	0	23
Total	43	3120	454	16	79	7	0	7	3	0	0	0	0	3729
Percent	1.2%	83.7%	12.2%	0.4%	2.1%	0.2%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	08:00	09:00	08:00	10:00	07:00		10:00	07:00					08:00
Vol.	5	252	28	2	9	1		1	1					290
PM Peak	17:00	16:00	16:00	14:00	15:00	13:00		14:00						16:00
Vol.	8	354	59	6	12	1		2						425

PRECISION
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Belknap Road
west of Edgell Road
City, State: Framingham, MA
Client: GPI/ N. Rogers

165101 B Class
Site Code: MAX-2015047.05

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/19/1														
6	0	8	0	0	0	0	0	0	0	0	0	0	0	8
01:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
05:00	0	14	5	0	0	0	0	0	0	0	0	0	0	19
06:00	0	78	11	0	2	0	0	0	0	0	0	0	0	91
07:00	5	167	21	2	4	0	0	0	0	0	0	0	0	199
08:00	4	241	31	2	5	0	0	1	0	0	0	0	0	284
09:00	2	141	21	1	6	0	0	0	0	0	0	0	0	171
10:00	0	98	23	0	4	0	0	0	0	0	0	0	0	125
11:00	0	117	24	3	3	0	0	0	0	0	0	0	0	147
12 PM	1	141	23	0	5	1	0	0	0	0	0	0	0	171
13:00	2	159	21	1	1	0	0	0	0	0	0	0	0	184
14:00	4	232	37	4	4	0	0	1	0	0	0	0	0	282
15:00	3	316	43	1	6	0	0	3	0	0	0	0	0	372
16:00	5	369	45	0	6	2	0	1	0	0	0	0	0	428
17:00	1	354	50	0	4	2	0	1	0	0	0	0	0	412
18:00	4	293	34	0	4	0	0	0	0	0	0	0	0	335
19:00	1	195	17	0	5	1	0	0	0	0	0	0	0	219
20:00	0	119	12	0	1	0	0	0	0	0	0	0	0	132
21:00	0	78	5	0	1	0	0	0	0	0	0	0	0	84
22:00	1	39	1	0	0	0	0	0	0	0	0	0	0	41
23:00	0	26	1	0	0	0	0	0	0	0	0	0	0	27
Total	33	3193	426	14	61	6	0	7	0	0	0	0	0	3740
Percent	0.9%	85.4%	11.4%	0.4%	1.6%	0.2%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	08:00	08:00	11:00	09:00			08:00						08:00
Vol.	5	241	31	3	6			1						284
PM Peak	16:00	16:00	17:00	14:00	15:00	16:00		15:00						16:00
Vol.	5	369	50	4	6	2		3						428

PRECISION
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Belknap Road
west of Edgell Road
City, State: Framingham, MA
Client: GPI/ N. Rogers

165101 B Speed
Site Code: MAX-2015047.05

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
05/18/ 16	0	0	0	2	4	0	0	0	0	0	0	0	0	6	32	30
01:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1	38	37
02:00	0	0	0	1	2	0	0	0	0	0	0	0	0	3	32	30
03:00	0	0	0	2	1	0	0	0	0	0	0	0	0	3	31	29
04:00	0	0	0	1	2	3	1	0	0	0	0	0	0	7	38	35
05:00	0	0	0	10	18	13	3	0	0	0	0	0	0	44	37	33
06:00	0	1	13	70	112	28	2	0	0	0	0	0	0	226	33	31
07:00	**109**	**29**	**71**	107	132	23	0	0	0	0	0	0	0	**471**	32	23
08:00	2	12	29	**124**	**188**	22	5	0	0	0	0	0	0	382	33	29
09:00	3	2	5	54	131	**36**	**6**	**3**	0	0	0	0	0	240	35	31
10:00	0	0	2	53	79	21	3	1	0	0	0	0	0	159	34	31
11:00	0	0	9	60	95	17	6	0	0	**1**	0	0	0	188	33	31
12 PM	0	0	5	35	101	**30**	4	**1**	0	0	0	0	0	176	35	32
13:00	1	0	3	55	83	20	4	0	0	0	0	0	0	166	33	31
14:00	0	0	6	**74**	88	22	2	0	0	0	0	0	0	192	33	30
15:00	1	5	13	66	**120**	19	5	0	0	0	0	0	0	**229**	33	30
16:00	3	3	12	71	113	22	1	1	**1**	0	0	0	0	227	33	30
17:00	**63**	**13**	**42**	44	53	8	1	0	0	0	0	0	0	224	31	22
18:00	2	0	16	71	115	16	2	0	0	0	0	0	0	222	33	30
19:00	0	0	4	36	66	21	**6**	1	0	0	0	0	0	134	35	32
20:00	0	0	4	28	34	13	1	0	0	0	0	0	0	80	34	31
21:00	0	0	2	21	24	12	3	0	0	0	0	0	0	62	36	31
22:00	0	0	1	5	10	7	1	1	0	0	0	0	0	25	37	33
23:00	0	0	1	2	11	4	2	0	0	0	0	0	0	20	37	33
Total	184	65	238	992	1582	358	58	8	1	1	0	0	0	3487		
%	5.3%	1.9%	6.8%	28.4%	45.4%	10.3%	1.7%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	07:00	07:00	08:00	08:00	09:00	09:00	09:00		11:00				07:00		
Vol.	109	29	71	124	188	36	6	3		1				471		
PM Peak	17:00	17:00	17:00	14:00	15:00	12:00	19:00	12:00	16:00					15:00		
Vol.	63	13	42	74	120	30	6	1	1					229		

Stats

15th Percentile :	24 MPH
50th Percentile :	29 MPH
85th Percentile :	33 MPH
95th Percentile :	37 MPH
Mean Speed(Average) :	29 MPH
10 MPH Pace Speed :	25-34 MPH
Number in Pace :	2574
Percent in Pace :	73.8%
Number of Vehicles > 30 MPH :	1692
Percent of Vehicles > 30 MPH :	48.5%

Belknap Road
west of Edgell Road
City, State: Framingham, MA
Client: GPI/ N. Rogers

PRECISION
D A T A
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Office: 508-875-0100 Fax: 508-875-0118
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165101 B Speed
Site Code: MAX-2015047.05

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
05/19/ 16	0	0	0	4	4	2	0	0	0	0	0	0	0	10	35	31
01:00	0	0	0	0	1	1	0	0	0	0	0	0	0	2	37	35
02:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1	33	32
03:00	0	0	0	1	1	0	0	0	0	0	0	0	0	2	32	30
04:00	0	0	1	0	5	0	1	0	0	0	0	0	0	7	33	32
05:00	1	0	2	15	27	5	**2**	0	0	0	0	0	0	52	33	31
06:00	0	1	7	48	109	**43**	2	0	0	0	0	0	0	210	35	32
07:00	**121**	**17**	**46**	109	126	28	1	0	0	0	0	0	0	**448**	32	23
08:00	19	15	24	**110**	**143**	27	0	0	0	0	0	0	0	338	33	28
09:00	1	0	10	68	139	40	0	0	0	0	0	0	0	258	34	31
10:00	0	1	9	34	90	29	1	0	0	0	0	0	0	164	34	31
11:00	1	0	7	66	92	30	2	0	0	0	0	0	0	198	34	31
12 PM	0	1	14	54	93	26	4	0	0	0	0	0	0	192	34	31
13:00	1	1	3	58	89	23	**6**	0	0	0	0	0	0	181	34	31
14:00	0	1	2	47	94	30	3	0	0	0	0	0	0	177	35	31
15:00	1	0	0	63	109	25	5	0	0	0	0	0	0	203	33	31
16:00	4	0	4	77	108	**38**	1	0	0	0	**1**	0	0	233	34	31
17:00	**23**	**12**	**33**	**106**	89	18	3	0	0	0	0	0	0	**284**	32	27
18:00	2	0	1	43	**120**	33	0	0	0	0	0	0	0	199	34	31
19:00	1	1	3	26	80	22	2	**2**	0	0	0	0	**1**	138	35	32
20:00	1	0	6	33	48	8	0	0	**1**	0	0	0	0	97	33	30
21:00	1	0	1	18	23	8	2	0	0	0	0	0	0	53	35	31
22:00	0	0	0	10	15	3	2	1	0	0	0	0	0	31	36	32
23:00	0	0	2	4	8	4	0	0	0	0	0	0	0	18	35	31
Total	177	50	175	994	1614	443	37	3	1	0	1	0	1	3496		
%	5.1%	1.4%	5.0%	28.4%	46.2%	12.7%	1.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	07:00	07:00	08:00	08:00	06:00	05:00							07:00		
Vol.	121	17	46	110	143	43	2							448		
PM Peak	17:00	17:00	17:00	17:00	18:00	16:00	13:00	19:00	20:00		16:00		19:00	17:00		
Vol.	23	12	33	106	120	38	6	2	1		1		1	284		

Stats

15th Percentile :	24 MPH
50th Percentile :	30 MPH
85th Percentile :	33 MPH
95th Percentile :	37 MPH
Mean Speed(Average) :	29 MPH
10 MPH Pace Speed :	25-34 MPH
Number in Pace :	2608
Percent in Pace :	74.6%
Number of Vehicles > 30 MPH :	1777
Percent of Vehicles > 30 MPH :	50.8%

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WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
05/18/ 16	0	0	0	5	6	1	1	0	0	0	0	0	0	13	34	31
01:00	0	0	0	0	1	1	1	0	0	0	0	0	0	3	41	37
02:00	0	0	0	0	6	0	0	0	0	0	0	0	0	6	33	32
03:00	0	0	1	0	1	0	0	0	0	0	0	0	0	2	32	27
04:00	0	0	0	0	3	1	0	0	0	0	0	0	0	4	36	33
05:00	0	0	0	11	8	7	0	0	0	0	0	0	0	26	36	31
06:00	**1**	1	4	17	37	11	1	0	0	0	0	0	0	72	34	31
07:00	1	1	**26**	64	90	16	2	0	0	0	0	0	0	200	33	29
08:00	1	1	14	**86**	**159**	24	**5**	0	0	0	0	0	0	**290**	33	30
09:00	1	**2**	6	49	104	**36**	2	0	0	0	0	0	0	200	35	31
10:00	0	0	3	58	57	19	1	**1**	0	0	0	0	0	139	34	31
11:00	1	0	10	43	66	19	2	0	0	0	0	0	0	141	33	30
12 PM	0	0	9	46	72	27	2	**1**	0	0	0	0	0	157	35	31
13:00	0	0	5	45	86	25	**5**	0	0	0	0	0	0	166	35	31
14:00	**1**	1	7	93	129	38	2	0	0	0	0	0	0	271	33	31
15:00	1	0	20	137	169	47	4	0	0	0	0	0	0	378	33	30
16:00	0	0	9	124	**231**	57	3	1	0	0	0	0	0	**425**	33	31
17:00	1	**5**	**33**	**170**	154	37	4	0	0	0	0	0	0	404	33	29
18:00	1	0	9	90	166	**63**	5	1	**1**	0	0	0	0	336	35	32
19:00	1	0	1	38	102	35	3	1	0	0	0	0	0	181	35	32
20:00	0	0	5	41	65	26	1	1	0	0	0	0	0	139	35	31
21:00	0	0	4	50	43	15	0	1	0	0	0	0	0	113	33	30
22:00	0	0	1	8	17	10	2	1	1	0	0	0	0	40	38	33
23:00	0	0	1	6	11	2	2	0	1	0	0	0	0	23	37	32
Total	10	11	168	1181	1783	517	48	8	3	0	0	0	0	3729		
%	0.3%	0.3%	4.5%	31.7%	47.8%	13.9%	1.3%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	06:00	09:00	07:00	08:00	08:00	09:00	08:00	10:00						08:00		
Vol.	1	2	26	86	159	36	5	1						290		
PM Peak	14:00	17:00	17:00	17:00	16:00	18:00	13:00	12:00	18:00					16:00		
Vol.	1	5	33	170	231	63	5	1	1					425		

Stats

15th Percentile :	25 MPH
50th Percentile :	30 MPH
85th Percentile :	34 MPH
95th Percentile :	37 MPH
Mean Speed(Average) :	31 MPH
10 MPH Pace Speed :	25-34 MPH
Number in Pace :	2964
Percent in Pace :	79.5%
Number of Vehicles > 30 MPH :	2002
Percent of Vehicles > 30 MPH :	53.7%

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Belknap Road
west of Edgell Road
City, State: Framingham, MA
Client: GPI/ N. Rogers

165101 B Speed
Site Code: MAX-2015047.05

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
05/19/ 16	0	0	0	1	4	2	0	0	**1**	0	0	0	0	8	38	35
01:00	0	0	0	0	2	2	0	0	0	0	0	0	0	4	37	35
02:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1	33	32
03:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1	33	32
04:00	0	0	0	0	2	1	0	0	0	0	0	0	0	3	36	34
05:00	0	1	0	9	4	5	0	0	0	0	0	0	0	19	36	30
06:00	0	0	1	28	46	12	**4**	0	0	0	0	0	0	91	34	31
07:00	**3**	1	**24**	75	79	17	0	0	0	0	0	0	0	199	33	29
08:00	0	0	11	**96**	**144**	**32**	1	0	0	0	0	0	0	**284**	33	31
09:00	2	0	10	51	82	26	0	0	0	0	0	0	0	171	34	30
10:00	0	**2**	10	36	59	16	1	**1**	0	0	0	0	0	125	33	30
11:00	0	0	10	40	74	21	2	0	0	0	0	0	0	147	34	31
12 PM	**5**	0	11	48	85	19	3	0	0	0	0	0	0	171	33	30
13:00	0	0	5	57	93	24	5	0	0	0	0	0	0	184	34	31
14:00	3	1	14	86	139	37	1	0	**1**	0	0	0	0	282	33	30
15:00	0	0	9	122	187	49	5	0	0	0	0	0	0	372	33	31
16:00	0	0	**17**	108	**229**	**69**	5	0	0	0	0	0	0	**428**	34	31
17:00	0	**2**	16	**132**	216	40	5	**1**	0	0	0	0	0	412	33	31
18:00	0	0	4	77	184	61	**8**	1	0	0	0	0	0	335	35	32
19:00	1	0	5	58	107	43	4	0	0	0	0	0	**1**	219	35	31
20:00	0	0	6	42	63	18	3	0	0	0	0	0	0	132	34	31
21:00	0	0	5	29	37	13	0	0	0	0	0	0	0	84	34	30
22:00	0	0	1	15	21	3	0	0	1	0	0	0	0	41	33	31
23:00	0	0	1	8	16	2	0	0	0	0	0	0	0	27	33	31
Total	14	7	160	1118	1875	512	47	3	3	0	0	0	1	3740		
%	0.4%	0.2%	4.3%	29.9%	50.1%	13.7%	1.3%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	10:00	07:00	08:00	08:00	08:00	06:00	10:00	00:00					08:00		
Vol.	3	2	24	96	144	32	4	1	1					284		
PM Peak	12:00	17:00	16:00	17:00	16:00	16:00	18:00	17:00	14:00				19:00	16:00		
Vol.	5	2	17	132	229	69	8	1	1				1	428		

Stats

15th Percentile :	25 MPH
50th Percentile :	30 MPH
85th Percentile :	34 MPH
95th Percentile :	37 MPH
Mean Speed(Average) :	31 MPH
10 MPH Pace Speed :	25-34 MPH
Number in Pace :	2993
Percent in Pace :	80.0%
Number of Vehicles > 30 MPH :	2066
Percent of Vehicles > 30 MPH :	55.2%

D. COLLISION DATA

SEGMENT CRASH RATE WORKSHEET

CITY/TOWN : Framingham COUNT DATE : May-16

DISTRICT : 3

~ SEGMENT DATA ~

ROADWAY NAME: Belknap Road

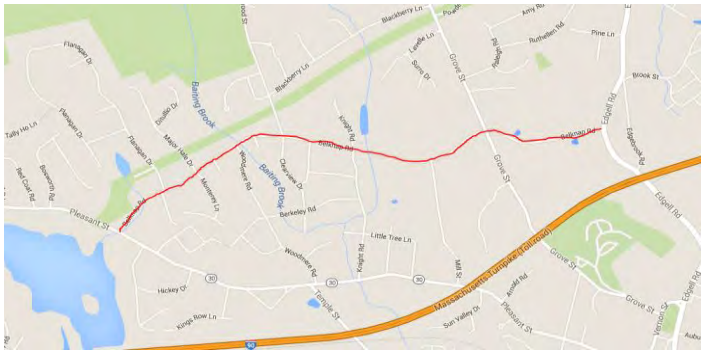
START POINT: Pleasant Street (Route 30)

END POINT: Edgell Road

FUNCTIONAL CLASSIFICATION OF ROADWAY: Urban Collector

ROADWAY DIAGRAM (LABEL ROADWAY AND CROSS STREETS)

North



AVERAGE DAILY TRAFFIC

SEGMENT LENGTH IN MILES (**L**):	**1.76**
AVERAGE DAILY TRAFFIC VOLUME (**V**):	5,234

TOTAL # OF CRASHES:	22	# OF YEARS :	3	AVERAGE # OF CRASHES PER YEAR (**A**) :	**7.33**

CRASH RATE CALCULATION : **2.18**

$$\text{RATE} = \frac{(A * 1{,}000{,}000)}{(L * V * 365)}$$

Comments : Calculated using crashes obtained from MassDOT Crash Portal (2011-2013)

Project Title & Date: Belknap Road Traffic Calming Needs Assessment

Crash Number	Crash Date	Crash Time	City/Town	Crash Severity	Number of NonFatal Injuries	Number of Fatal Injuries	Number of Vehicles	Manner of Collision	Vehicle Action Prior to Crash	Vehicle Travel Directions	First Harmful Event	First Harmful Event Location	Vehicle Sequence of Events	Vehicle Configuration	Age of Driver - Youngest Known	Age of Driver - Oldest Known	Driver Contributing Codes	Road Surface	Ambient Light	Weather Condition	X	Y
2685350	1/27/2011	7:14 AM	FRAMINGHAM	Property damage only (none injured)	0	0	2	Head-on	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:S / V2:N	Collision with motor vehicle in traffic	Roadway	V1:(Collision with motor vehicle in traffic),(Cross median or centerline) V2:(Collision with motor vehicle in traffic),(Collision with ditch)	V1:(Passenger car) V2:(Passenger car)	16-20	45-54	D1:(Swerving or avoiding due to wind, slippery surface, vehicle, object, non-motorist in roadway, etc) D2:(No improper driving)	Snow	Daylight	Snow/Cloudy	205044.078	895700.6251
2711826	3/30/2011	7:07 AM	FRAMINGHAM	Non-fatal injury	1	0	1	Single vehicle crash	V1: Travelling straight ahead	V1:S	Collision with animal - other	Roadway	V1:(Collision with animal - other),(Ran off road left),(Collision with curb)	V1:(Light truck(van, mini-van, panel, pickup, sport utility) with only four tires)	16-20	16-20	D1:(Failure to keep in proper lane or running off road),(Driving too fast for conditions)	Dry	Daylight	Clear/Clear	203003.5675	895478.5865
2760655	9/9/2011	8:39 AM	FRAMINGHAM	Property damage only (none injured)	0	0	1	Single vehicle crash	V1: Travelling straight ahead	V1:E	Collision with utility pole	Shoulder - paved	V1:(Collision with utility pole)	V1:(Single-unit truck (2-axle, 6-tire))	55-64	55-64	D1:(No improper driving)	Dry	Daylight	Cloudy	203886.2973	895572.4667
3116354	5/30/2012	6:29 PM	FRAMINGHAM	Property damage only (none injured)	0	0	2	Rear-end	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:S / V2:E	Collision with motor vehicle in traffic	Roadway	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	V1:(Light truck(van, mini-van, panel, pickup, sport utility) with only four tires) V2:(Passenger car)	16-20	45-54	D1:(No improper driving) D2:(Followed too closely)	Dry	Daylight	Clear/Clear	205044.078	895700.6251
3659062	11/9/2013	11:14 AM	FRAMINGHAM	Non-fatal injury	1	0	2	Angle	V1: Turning left / V2:Travelling straight ahead	V1:N / V2:S	Collision with motor vehicle in traffic	Roadway	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	V1:(Passenger car) V2:(Passenger car)	35-44	65-74	D1:(Failed to yield right of way) D2:(No improper driving)	Dry	Daylight	Clear/Clear	205044.078	895700.6251
3352133	2/2/2013	10:00 PM	FRAMINGHAM	Non-fatal injury	1	0	1	Single vehicle crash	V1: Travelling straight ahead	V1:S	Collision with utility pole	Roadway	V1:(Collision with utility pole)	V1:(Light truck(van, mini-van, panel, pickup, sport utility) with only four tires)	65-74	65-74	D1:(Unknown)	Dry	Dark - lighted roadway	Clear	202767.5428	895342.1316
3629063	10/21/2013	1:19 PM	FRAMINGHAM	Property damage only (none injured)	0	0	2	Angle	V1: Travelling straight ahead / V2:Turning left	V1:S / V2:N	Collision with motor vehicle in traffic	Roadway	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	V1:(Passenger car) V2:(Passenger car)	35-44	65-74	D1:(No improper driving) D2:(Failed to yield right of way)	Dry	Daylight	Clear/Clear	205044.078	895700.6251
2765872	9/19/2011	5:37 PM	FRAMINGHAM	Non-fatal injury	1	0	2	Angle	V1: Travelling straight ahead / V2:Turning left	V1:N / V2:W	Collision with motor vehicle in traffic	Roadway	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic),(Collision with tree)	V1:(Passenger car) V2:(Light truck(van, mini-van, panel, pickup, sport utility) with only four tires)	16-20	25-34	D1:(Exceeded authorized speed limit) D2:(Failed to yield right of way)	Dry	Daylight	Clear/Clear	202989.6565	895466.4998
2772358	9/26/2011	7:40 AM	FRAMINGHAM	Non-fatal injury	2	0	2	Sideswipe, opposite direction	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:W / V2:E	Collision with motor vehicle in traffic	Roadway	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	V1:(Single-unit truck (2-axle, 6-tire)) V2:(Light truck(van, mini-van, panel, pickup, sport utility) with only four tires)				Dry	Daylight	Cloudy	203187.9065	895617.3125
3561241	8/6/2013	12:00 AM	FRAMINGHAM	Property damage only (none injured)	0	0	2	Sideswipe, opposite direction	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:W / V2:E	Collision with motor vehicle in traffic	Roadway	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	V1:(Passenger car) V2:(Single-unit truck (2-axle, 6-tire))	25-34	65-74	D1:(Unknown) D2:(Unknown)	Dry	Daylight	Cloudy	204069.8351	895520.993
2779523	10/10/2011	6:35 PM	FRAMINGHAM	Property damage only (none injured)	0	0	2	Angle	V1: Travelling straight ahead / V2:Turning left	V1:E / V2:E	Collision with motor vehicle in traffic	Roadway	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	V1:(Passenger car) V2:(Passenger car)	45-54	75-84	D1:(No improper driving) D2:(Failed to yield right of way)	Dry	Dark - lighted roadway	Clear	205044.078	895700.6251
3361048	2/19/2013	11:35 AM	FRAMINGHAM	Non-fatal injury	1	0	3	Rear-end	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic / V3:Travelling straight ahead	V1:S / V2:S / V3:S	Collision with motor vehicle in traffic	Roadway	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic) V3:(Collision with motor vehicle in traffic)	V1:(Passenger car) V2:(MOPED) V3:(MOPED)	21-24	45-54	D1:(No improper driving) D2:(No improper driving) D3:(Followed too closely)	Dry	Daylight	Clear/Clear	204452.7344	895692.1874
3566565	8/20/2013	8:15 AM	FRAMINGHAM	Non-fatal injury	1	0	1	Single vehicle crash	V1: Travelling straight ahead	V1:B	Collision with utility pole	Shoulder - unpaved	V1:(Collision with embankment),(Collision with utility pole)	V1:(Passenger car)	55-64	55-64	D1:(Inattention)	Dry	Daylight	Clear	202726.1475	895315.6643
3252018	9/6/2012	7:41 AM	FRAMINGHAM	Property damage only (none injured)	0	0	2	Angle	V1: Turning left / V2:Travelling straight ahead	V1:E / V2:S	Collision with motor vehicle in traffic	Roadway	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	V1:(Passenger car) V2:(Passenger car)	65-74	75-84	D1:(Unknown) D2:(Unknown)	Wet	Daylight	Rain/Rain	205044.078	895700.6251
3263146	9/24/2012	4:29 PM	FRAMINGHAM	Non-fatal injury	3	0	2	Angle	V1: Travelling straight ahead / V2:Turning left	V1:S / V2:E	Collision with motor vehicle in traffic	Roadway	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	V1:(Passenger car) V2:(Passenger car)	35-44	35-44	D1:(No improper driving) D2:(Failed to yield right of way)	Dry	Daylight	Clear	205044.078	895700.6251
3339355	1/10/2013	1:26 PM	FRAMINGHAM	Property damage only (none injured)	0	0	1	Single vehicle crash	V1: Travelling straight ahead	V1:W	Collision with tree	Outside roadway	V1:(Collision with tree)	V1:(Light truck(van, mini-van, panel, pickup, sport utility) with only four tires)	35-44	35-44	D1:(Failure to keep in proper lane or running off road)	Dry	Daylight	Clear	203530.5351	895645.4153
3060362	4/24/2012	4:10 PM	FRAMINGHAM	Non-fatal injury	2	0	2	Rear-end	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	V1:N / V2:N	Collision with motor vehicle in traffic	Roadway	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	V1:(Passenger car) V2:(Passenger car)	55-64	55-64	D1:(No improper driving) D2:(Inattention)	Dry	Daylight	Clear	205044.078	895700.6251
3542765	7/25/2013	10:00 AM	FRAMINGHAM	Property damage only (none injured)	0	0	2	Angle	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:W / V2:N	Collision with motor vehicle in traffic	Roadway	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	V1:(Passenger car) V2:(Passenger car)	45-54	55-64	D1:(Unknown) D2:(Unknown)	Dry	Daylight	Clear/Clear	203426.1718	895661.3127
2812186	11/27/2011	12:20 PM	FRAMINGHAM	Property damage only (none injured)	0	0	2	Rear-end	V1: Slowing or stopped in traffic / V2:Turning right	V1:E / V2:E	Collision with motor vehicle in traffic	Roadway	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	V1:(Passenger car) V2:(Passenger car)	25-34	45-54	D1:(No improper driving) D2:(Followed too closely)	Dry	Daylight	Cloudy	205044.078	895700.6251
3198554	7/15/2012	5:32 AM	FRAMINGHAM	Property damage only (none injured)	0	0	1	Single vehicle crash	V1: Travelling straight ahead	V1:W	Collision with ditch	Outside roadway	V1:(Ran off road left)	V1:(Passenger car)	21-24	21-24	D1:(Fatigued/asleep)	Dry	Dawn	Clear/Clear	202767.5428	895342.1316
3587240	8/30/2013	12:45 PM	FRAMINGHAM	Property damage only (none injured)	0	0	2	Rear-end	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	V1:E / V2:E	Collision with motor vehicle in traffic	Roadway	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	V1:(Passenger car) V2:(Passenger car)	25-34	55-64	D1:(No improper driving) D2:(Followed too closely)	Dry	Daylight	Clear/Clear	202596.375	895143.6249
2756758	8/28/2011	10:41 PM	FRAMINGHAM	Non-fatal injury	3	0	2	Head-on	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:W / V2:E	Collision with motor vehicle in traffic	Roadway	V1:(Collision with motor vehicle in traffic),(Collision with mail box) V2:(Collision with motor vehicle in traffic)	V1:(Passenger car) V2:(Passenger car)	16-20	25-34	D1:(No improper driving) D2:(Exceeded authorized speed limit),(Operating vehicle in erratic, reckless, careless, negligent or aggressive manner)	Wet	Dark - roadway not lighted	Cloudy	204572.7717	895652.9178

SELECT [Crash Number], [Crash Date], [Crash Time], [Crash Hour], [City/Town], [Locality], [RPA Abbreviation], [MassHighway District], [Crash Severity], [Maximum Injury Severity Reported], [Number of NonFatal Injuries], [Number of Fatal Injuries], [Number of Vehicles], [Manner of Collision], [Vehicle Action Prior to Crash], [Vehicle Travel Directions], [First Harmful Event], [First Harmful Event Location], [Most Harmful Event], [Vehicle Sequence of Events], [Vehicle Configuration], [FMSCA Reportable], [Age of Driver - Youngest Known], [Age of Driver - Oldest Known], [Driver Contributing Codes], [Non Motorist Type], [Non Motorist Action], [Non Motorist Location], [Hit & Run], [Road Surface], [Ambient Light], [Weather Condition], [Street Number], [Roadway], [Distance And Direction From Intersection], [Near Intersection Roadway], [Exit Route],

E. ADDITIONAL TRAFFIC CALMING INFORMATION

Table 2.1. Operating speeds traversing speed humps.

SPEED HUMP CHARACTERISTICS		85TH-PERCENTILE SPEED
LENGTH AND SHAPE	HEIGHT	
12-ft. (3.7-m) parabolic speed hump	3 in. (76 mm)	20 mph (32 km/hr.)
14-ft. (3.7-m) parabolic speed hump	3 in. (76 mm)	23 mph (37 km/hr.)
22-ft. (3.7-m) speed table, parabolic approaches	3 in. (76 mm)	30 mph (48 km/hr.)
22-ft. (3.7-m) speed table, straight approaches	3 5/8 in. (92 mm)	25 mph (40 km/hr.)

Source: Ewing, R. Traffic Calming: State of the Practice. *Washington, DC: Institute of Transportation Engineers, 1999. Prepared for U.S. Department of Transportation, Federal Highway Administration, Office of Safety Research and Development and Office of Human Environment, August 1999.*

ing and location of the speed humps. For example, Womble and Bretherton recommend 500 ft. (152 m) as the maximum distance between speed humps for an 85th-percentile operating speed between 25 and 30 mph (40 and 48 km/hr.).[29]

On short road segments (less than 1,000 ft. [305 m]), the installation of more than one speed hump does not necessarily affect operating speeds more than the installation of only one speed hump.[30] This is likely a result of the limited vehicular acceleration distance between speed humps on short segments.

The city of Portland evaluated the impact of speed humps on speed.[31] Speed measurements were taken approximately halfway between two speed humps. The study took place from three to six months after installation. The 14-ft. long (4.3-m long) speed humps and the 22-ft. long (6.7-m long) speed tables were 3 inch (in.) (76 millimeters [mm]) in height and spaced generally from 300 to 600 ft. (91 to 183 m) apart. The 85th-percentile speed, the percentage of drivers traveling over the speed limit, and the percentage of drivers traveling 10 mph (16 km/hr.) or more over the speed limit were measured before and after installation.

This study found that speed humps and speed tables were effective in reducing 85th-percentile operating speeds, specifically:[32]

- 14-ft. (4.3-m) speed humps reduced 85th-percentile speeds by an average of 6.9 mph to 25.8 mph (11.1 km/hr. to 41.5 km/hr.). In Portland, 14-ft. (4.3-m) speed humps are typically installed on local streets with a 25-mph (40-km/hr.) speed limit. This result is statistically significant.
- 22-ft. (6.7-m) speed tables reduced 85th-percentile speeds by an average of 8.2 mph to 29.9 mph (13.2 km/hr. to 48.1 km/hr.). In Portland, 22-ft. (6.7-m) speed tables are typically installed on local and neighborhood collector streets with a 25-mph (40-km/hr.) or 30-mph (48-km/hr.) speed limit. This result is statistically significant.
- Combining these results, the average reduction was 7.2 mph to 26.8 mph (11.6 km/hr. to 43.1 km/hr.), or a 21-percent decrease in 85th-percentile speeds after the installation of speed humps and speed tables. This result is statistically significant.

The Portland study also found that speed humps and speed tables are effective in reducing the number of drivers exceeding the speed limit:[33]

- 14-ft. (4.3-m) speed humps reduced the percentage of drivers exceeding the speed limit from 60 percent to 20 percent. The percentage of drivers exceeding the speed limit by more than 10 mph (16 km/hr.) was reduced from 14.5 percent to 1 percent.
- 22-ft. (6.7-m) speed tables reduced the percentage of drivers exceeding the speed limit from 77 percent to 43 percent. The percentage of drivers exceeding the speed limit by more than 10 mph (16 km/hr.) was reduced from 22 percent to 2.8 percent.

Studying three sections of a street in central Florida, Ponnaluri and Groce found that 12-ft. (3.7-m) speed humps that were 3.5 in. (89 mm) high and spaced from 405 ft. to 635 ft. (123 m to 194 m) apart showed a reduction in the 85th-percentile speed from 37–41 mph to 27–29 mph (from 60–66 km/hr. to 43–47 km/hr.) and decreased speed limit violations. The street had average weekday traffic volumes around 1,500 vehicles per day and a posted speed limit of 25 mph (40 km/hr.). The "after" data were collected one month after the installation of the speed humps.[34]

A Manatee County, Florida study conducted at 18 locations also recorded reductions in operating speeds from 35.5 mph (57.1 km/hr.) to 31 mph (50 km/hr.). The results were statistically significant.[35] The posted speed limit for the treated streets varied from 20 to 30 mph (32 to 48 km/hr.); the type of speed hump was not described.

2.3.1.1 Summary

The decision to install speed humps/tables includes consideration of the posted speed limit and the operating speed of traffic. Speed

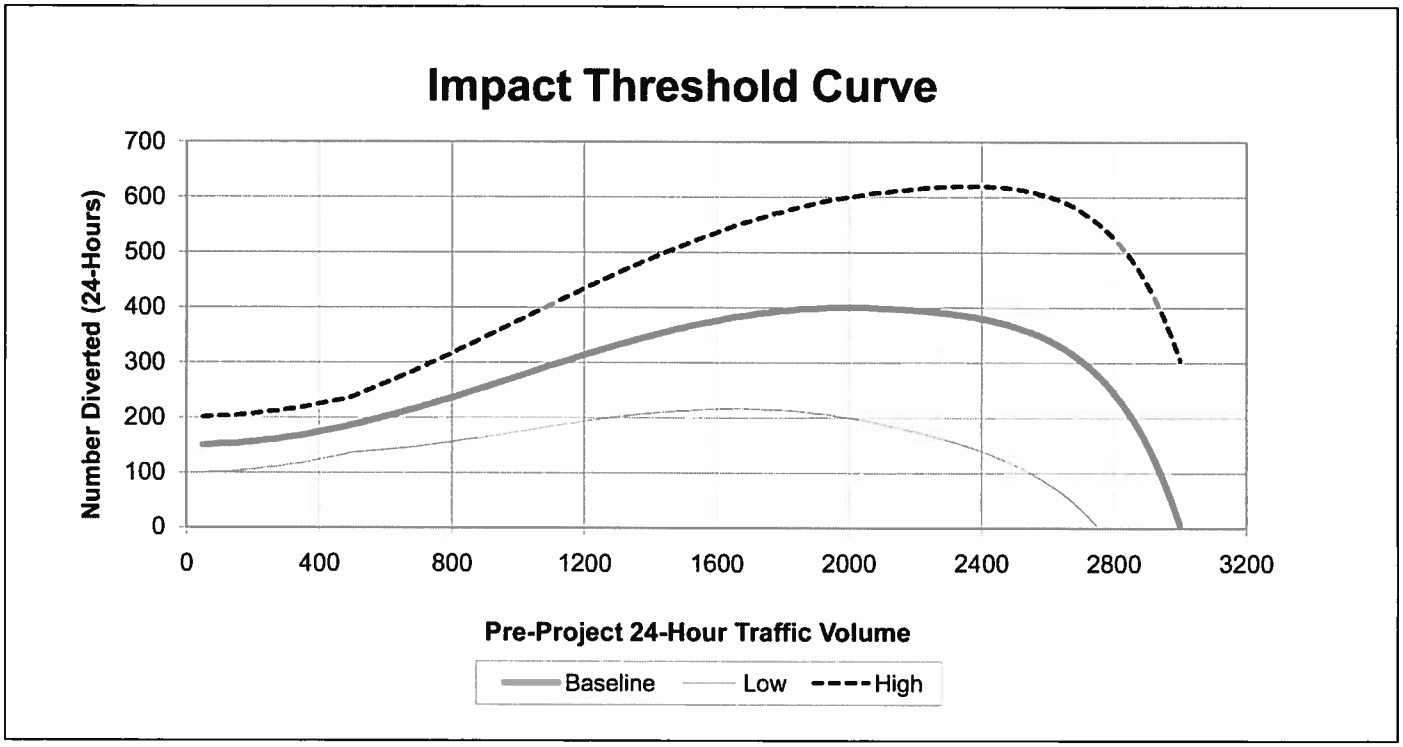


Figure 2.2. Portland, Oregon's impact threshold curve for parallel streets.
Note: The upper and lower boundary lines assist the engineer in determining a true need to mitigate for diversion by accounting for daily fluctuations in traffic volumes. Some diversion from the project street is to be expected and is considered acceptable. Diversion volumes below the baseline do not need mitigation. Diversions volumes between the baseline and upper boundary may need mitigation. Diversion volumes above the upper boundary need to be mitigated.

Source: City of Portland, Oregon.

An areawide approach is needed to avoid simply diverting traffic from roads with speed humps to parallel untreated roads, but the extent of the diversion problem is unclear at present. There has been some work on the development of an impact threshold curve that specifies allowable traffic increases on local parallel streets, but the results have not been fully evaluated.

Speed humps/tables have, however, been shown to reduce traffic volumes. The combined results for 14-ft. (4.3-m) and 22-ft. (6.7-m) speed humps and speed tables investigated in the city of Portland showed an average traffic reduction of 28 percent. Ewing found that 22-ft. (6.7-m) speed tables resulted in less volume change compared to 12-ft. (3.7-m) and 14-ft. (4.3-m) humps (12 percent compared to 18 to 22 percent).[55]

2.3.3 Emergency Vehicle Access

Emergency vehicle response times may increase after the installation of speed humps/tables. Speed humps/tables should not be installed on streets that are defined or used as primary or routine emergency vehicle access routes unless it is considered acceptable to the emergency services.[56,57] Procedures for consultation with emergency services representatives (police, fire and ambulance) are discussed in Chapter 3.

Various evaluations of the impact of speed humps on emergency vehicles are available. For fire trucks, Noyes & Associates found that the delay per speed hump was:[58]

- 2.8 to 4.7 seconds per speed hump in Boulder, Colorado;
- 0 to 9.4 seconds per speed hump in Portland; and
- 1.8 to 9.8 seconds per speed hump in Austin, Texas.

In another study of the delays caused by speed humps/tables, six different types of fire vehicles were tested over routes with speed humps.[59] The acceleration times for the fire vehicles (0 to 40 mph [0 to 64 km/hr.]) ranged from 12 to 27 seconds. The vehicles were of varying length (21–57 ft. [6.4–17.4 m]) and weight (23,170–53,960 pounds [10.5–24.5 metric tons]). The vehicles were driven over streets with 22-ft. (6.7-m) speed tables (6-ft. [1.8-m] parabolic approaches on both sides of a 10-ft. [3.0-m] plateau) and 14-ft. (4.3-m) parabolic speed humps. At the 22-ft. (6.7-m) speed tables, delay ranged from 0 to 9.2 seconds per speed table. At the 14-ft. (4.3-m) speed humps, delay ranged from 1.0 to 9.4 seconds per speed hump. Driver performance did not appear to substantially influence the results. The 14-ft. (4.3-m) speed hump appeared to have more impact on delay to shorter vehicles.[60]

In Montgomery County, Maryland, fire trucks were timed on streets with 12-ft. (3.7-m) parabolic speed humps. The delays measured were 2.8 to 7.5 seconds per speed hump. Montgomery County allows speed tables on emergency response routes.[61] The city of Peoria, Arizona also permits speed tables on streets used frequently by emergency services.

general spacing should be determined using the measured 85th-percentile operating speed compared to the desired 85th-percentile operating speed. Second, the location of the first speed hump/table should be determined, then the remaining locations should be established while addressing the considerations discussed in the following sections. Flexibility and engineering judgment are required for this task. General guidelines based on the experience of several agencies are provided in the following sections.

A single hump/table positioned near the midpoint of a short block likely would provide satisfactory speed control over the entire block. For longer blocks, two or more speed humps placed along the same street in an evenly spaced pattern (a series of speed humps) are more effective than single-hump installations.

Speed hump projects typically extend between higher-order streets. As noted by the city of Glendale, Arizona and many others, it is always a good idea to consider a whole neighborhood rather than a single street. This way, the diversion of traffic volumes onto adjacent streets can be better managed.

4.3.1 Spacing

The first speed hump in a series is normally located in a position where it cannot be approached at high speed from either direction. To achieve this objective, it is typically installed within approximately 200 ft. (61 m) or less of a small-radius curve or stop sign or, if installed on a street with a significant downgrade, at the top of a hill.

The spacing between successive speed humps is usually dependent on the measured 85th-percentile operating speed compared to the desired 85th-percentile operating speed on the treated streets.[124-126] It is important to determine the appropriate spacing between speed humps to achieve the desired operating speed with minimal speed variation.

Studies and experience have shown that 14-ft. (4.3-m) speed humps spaced from 260 to 500 ft. (79 to 152 m) apart generally will result in 85th-percentile operating speeds ranging from 25 to 30 mph (40 to 48 km/hr.).[127-130]

Speed tables (22-ft. (6.7-m) long) placed 300 to 500 ft. (91 to 152 m) apart will provide 85th-percentile operating speeds of 28 to 32 mph (45 to 52 km/hr.).[131,132]

Figure 4.9 illustrates the general relationship between hump spacing and vehicle speeds midway between the humps.

The following guidelines are recommended for determining the general spacing and layout of speed humps and the total number

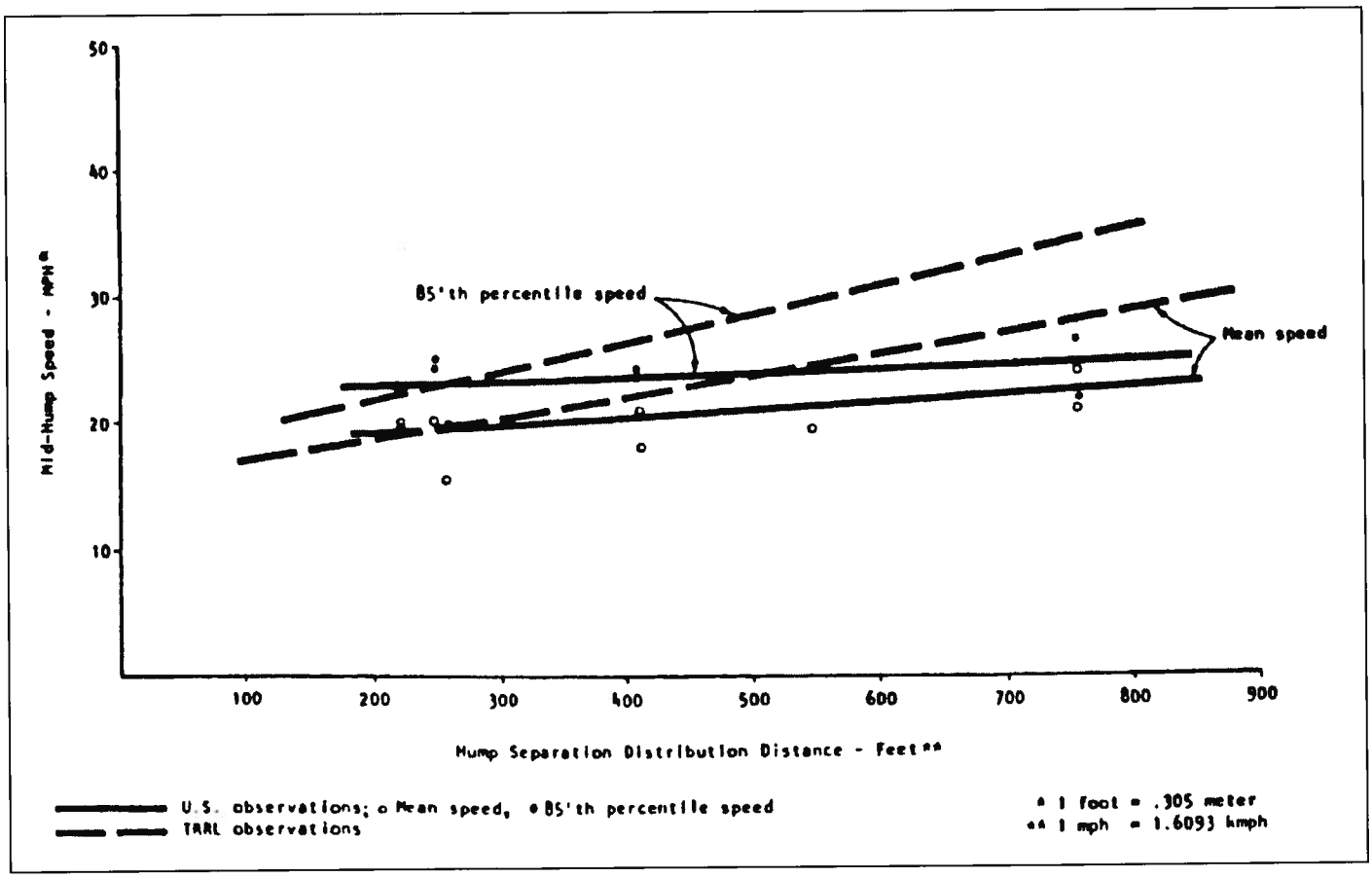


Figure 4.9. Relationship between spacing and speed.

Source: Improving the Residential Street Environment. *Report No. RD-81/031. Washington, DC: Federal Highway Administration, May 1981.*

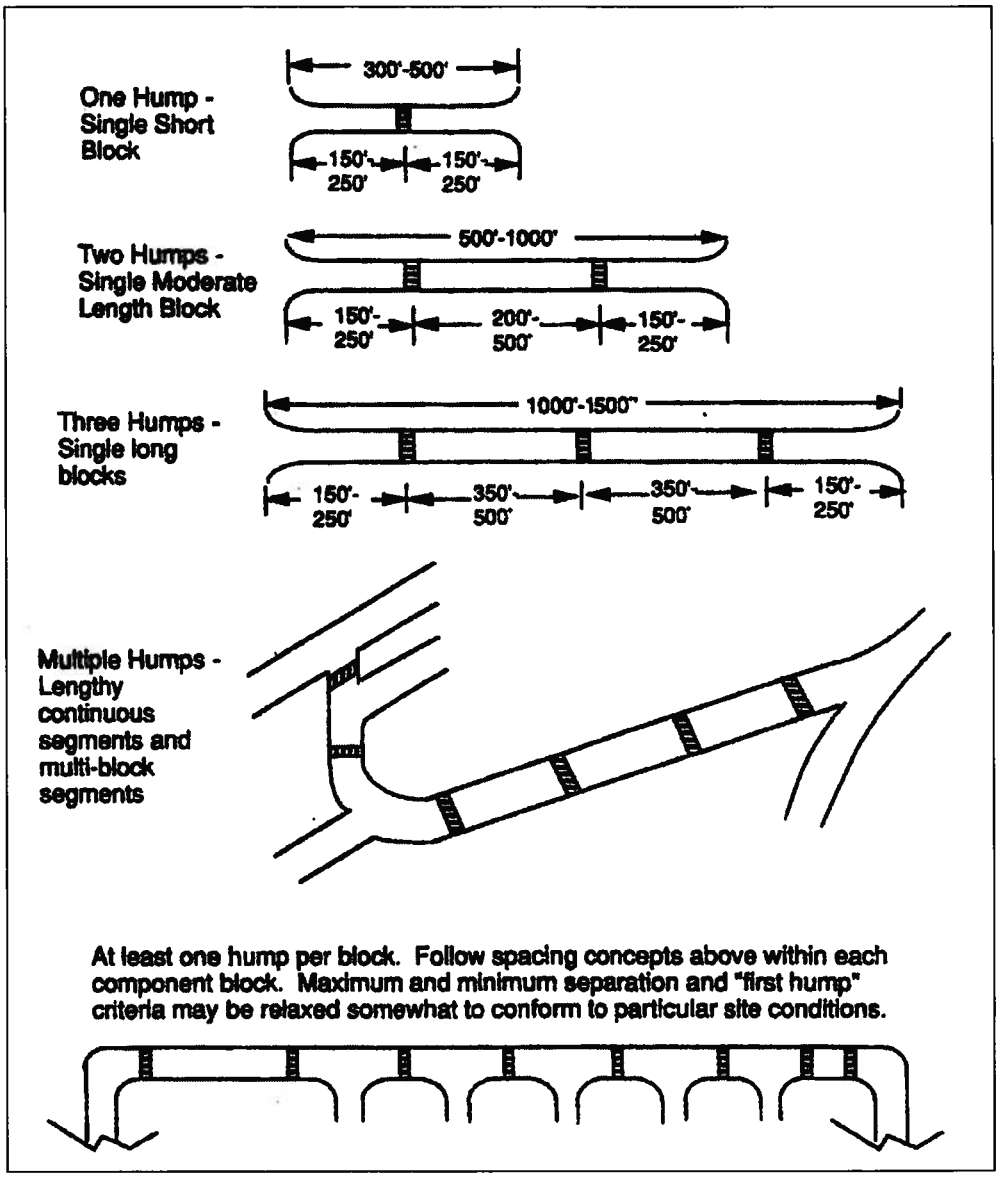


Figure 4.10. Spacing of speed humps.

Source: Smith Jr., D.T. and D. Appleyard. Improving the Residential Street Environment: Final Report. *Washington, DC: U.S. Department of Transportation, FHWA-RD-81/031, 1981.*

of speed humps for various street segment lengths, as shown in Figure 4.10:[133]

- A single speed hump is recommended for use on single short blocks (300 to 500 ft. [91 to 152 m]).
- A two-hump configuration may be satisfactory on single-block segments of moderate length (500 to 1,000 ft. [152 to 305 m]).
- On very long blocks (1,000 to 1,500 ft. [305 to 457 m]), three or more humps may be necessary.
- On lengthy continuous segments or on segments comprising a number of blocks, it is recommended to space interior humps 260 to 500 ft. (79 to 152 m) apart. At least one speed hump should be placed in each block of a segment. Experience in Portland has indicated that if block spacing is closer than 200 ft. (61 m), a hump every block is excessive, and greater spacing may be more effective.

4.3.2 Location

The final location of speed humps/tables is dependent on site-specific considerations, which makes the determination of actual spacing and final location a complex task. After the general spacing and layout of the speed humps/tables have been established, the final location of each speed hump/table is determined by considering the following:

- **Vertical alignment:** Speed humps/tables are normally considered for use on streets with grades of 8 percent or less approaching the hump/table. When installed on streets with significant downgrades, special care should be taken to ensure that vehicles

potentially affected parallel roads. Also, if the study street passes through more than one neighborhood, each neighborhood has a vote.

The affected area will be larger for volume control measures than for speed control measures and may be larger for severe speed control measures such as speed humps than for mild measures such as center island narrowings. In projecting the affected area, staff may wish to consult volume-impact information from *Traffic Calming: State of the Practice.* (See Table 2-1.) Volume reductions on one street translate into volume increases on nearby parallel streets to which the traffic is diverted. Absent better estimates, average percentage reductions in traffic volumes may be applied to treated streets, and estimates of diverted traffic may be assigned to neighboring streets in order to determine if an impact threshold is met.

In collecting "before" traffic data on all significant streets within the affected area, staff should measure all traffic variables required to determine funding priority (see "Priority Rating Systems") and eligibility for different treatments (see "Application Guidelines").

2.2.2 Public Involvement

For about half of the places surveyed in 2004, public involvement is limited to passing petitions, voting on plans, or voicing opinions at public hearings. The public reacts to plans but does not participate in the development of them. It is an up or down, go or no-go, support or oppose decision for the public.

TABLE 2-1. VOLUME IMPACTS OF COMMON TRAFFIC CALMING MEASURES

MEASURE	AVERAGE % REDUCTION IN TRAFFIC VOLUME
Speed Humps	20
Speed Tables	12
Traffic Circles	5
Narrowings	10
Full Closures	44
Half Closures	42
Diagonal Diverters	35

Source: R. Ewing, *Traffic Calming: State of the Practice* (Washington, D.C.: Institute of Transportation Engineers/ Federal Highway Administration, 1999).

TABLE 3-3. SPEED IMPACTS OF TRAFFIC CALMING MEASURES*

	SAMPLE SIZE	AVERAGE SPEED AFTER TRAFFIC CALMING	AVERAGE CHANGE IN SPEED WITH TRAFFIC CALMING	AVERAGE % CHANGE IN SPEED WITH TRAFFIC CALMING
12' Humps	184	27.3 mph (4.0 mph)	–7.8 mph (3.7 mph)	–22 (9)
14' Humps	15	25.6 (2.1)	–7.7 (2.1)	–23 (6)
Lumps	49	27.0 (3.4)	–8.9 (5.3)	–25 (12)
22' Tables	78	29.2 (3.1)	–7.3 (3.4)	–20 (8)
Longer Tables	11	31.3 (2.9)	–3.6 (2.6)	–10 (7)
Raised Intersections	3	34.3 (6.0)	–0.3 (3.8)	–1 (10)
Mini-circles	45	30.3 (4.4)	–3.9 (3.2)	–11 (10)
Narrowings	7	32.3 (2.8)	–2.6 (5.5)	–4 (22)
One-lane Slow Points	5	28.6 (3.1)	–4.8 (1.3)	–14 (4)
Half Closures	16	26.3 (5.2)	–6.0 (3.6)	–19 (11)
Diagonal Diverters	7	27.9 (5.2)	–1.4 (4.7)	–4 (17)

* Values in parentheses are standard deviations from the average.
Source: Ewing, *Traffic Calming: State of the Practice*, p. 104.

Two volume impacts are presented in Table 3-4: average absolute change in daily traffic from before to after treatment, and average percentage change in daily traffic from before to after treatment. Standard deviations from these averages are also presented to give some idea of the variability of results across studies. As expected, the largest volume reductions occur with street closures and other volume control measures. However, significant reductions also occur with humps and other speed control measures. The distinction between volume controls and speed controls becomes somewhat blurred in practice.

TABLE 3-4. VOLUME IMPACTS OF TRAFFIC CALMING MEASURES*

	SAMPLE SIZE	AVERAGE CHANGE IN VOLUME WITH TRAFFIC CALMING	AVERAGE % CHANGE IN VOLUME WITH TRAFFIC CALMING
12' Humps	143	–355 vpd (591)	–18 (24)
14' Humps	15	–529 (741)	–22 (26)
Lumps	18	–165 (211)	–7 (17)
22' Tables	46	–415 (649)	–12 (20)
Minicircles	49	–293 (584)	–5 (46)
Narrowings	11	–263 (2178)	–10 (51)
One-lane Slow Points	5	–392 (384)	–20 (19)
Full Closures	19	–671 (786)	–44 (36)
Half Closures	53	–1611 (2444)	–42 (41)
Diagonal Diverters	27	–501 (622)	–35 (46)
Other Volume Controls	10	–1167 (1781)	–31 (36)

* Values in parentheses are standard deviations from the average.
Source: Ewing, *Traffic Calming: State of the Practice*, p. 106.

3.3.3 Safety Impacts

By slowing traffic, eliminating conflicting movements, and sharpening drivers' attention, traffic calming may result in fewer collisions. Due to lower speeds, collisions may be less serious when they occur. What makes safety impacts so important is the fact that opposition to traffic calming is based principally on safety concerns related to emergency response.

Safety impacts of traffic calming measures, with and without adjustments for traffic diversion, are presented in Table 3-5. A difference-of-means test for paired samples was used to check for significant changes

in collision frequencies after traffic calming. The test was applied to the entire sample and to subsamples of different traffic calming measures. The test was also applied to the subsample of measures for which before-and-after traffic volumes were available, adjusting collision frequencies after traffic calming for changes in traffic volumes and hence changes in exposure.

For the sample as a whole, collisions decline to a very significant degree after traffic calming. (The difference is statistically significant at the 0.001 probability level.) Adjusting for changes in traffic volumes, and dropping cases for which volume data are not available, collisions decline to a less significant degree (but still statistically significant at the conventional 0.05 level). This drop in statistical significance has as much to do with the exclusion of Seattle circles (with their amazing safety record) as with the adjustment for lower traffic volumes after traffic calming.

All individual traffic calming measures reduce the average number of collisions on treated streets, and 22-foot tables and traffic circles produce differences that are statistically significant. Including Seattle data, circles are by far the best performers.

TABLE 3-5. SAFETY IMPACTS OF TRAFFIC CALMING MEASURES

	SAMPLE SIZE	AVERAGE NUMBER OF COLLISIONS BEFORE/ AFTER TREATMENT	% CHANGE IN COLLISIONS	*T*-STATISTIC (SIGNIFICANCE LEVEL—TWO-TAILED TEST)
Humps	54	2.8/2.4	–14	–1.2 (0.22)
22' Tables	51	1.5/0.8	–47	–3.0 (0.005)
Mini-circles				
without Seattle	17	5.9/4.2	–29	–2.2 (0.05)
with Seattle	130	2.2/0.6	–73	–10.8 (0.001)
Roundabouts	11	9.3/5.9	–37	N/A
All Measures*				
without volume adjustments	235	2.2/1.1	–50	–8.6 (0.001)
with adjustments	47	1.8/1.2	–33	–2.5 (0.05)

* These figures do not include data for roundabouts. In the second line, collision frequencies were adjusted proportionally for changes in traffic volumes, and hence exposure, after traffic calming.

Source: All but the roundabout data are drawn from Ewing, *Traffic Calming: State of the Practice*, p. 112. The roundabout data come from R. Troutbeck et al., *Roundabouts: An Informational Guide* (Washington, D.C.: Federal Highway Administration, 2000), p. 112.

TABLE 3-6. APPLICATION GUIDELINES (SACRAMENTO, CALIF.)

TYPES OF MEASURES	ROADWAY CLASSIFICATION			BUS OR EMERGENCY-RESPONSE ROUTE	OTHER CONSIDERATIONS
	ARTERIALS	COLLECTORS	LOCAL STREETS		
PHASE I NONRESTRICTIVE MEASURES					
Edgeline/Centerline Striping	ADT < 10,000; Speed Limit ≤ 35 mph			OK	(None)
Angled Parking	ADT < 4,000; Width ≥ 48 feet; Speed Limit ≤ 30 mph			No	Not used with bike lanes
Phase I Vertical Measures					
Speed Humps	No	ADT < 4,000; Speed Limit ≤ 30 mph		No	Grade ≤ 8%
Speed Lumps	No			OK	
Speed Tables	ADT < 7,500; Speed Limit ≤ 35 mph			OK	
Raised Crosswalks				OK	
Raised Intersections				OK	
Textured Pavement	Yes			OK	(None)
Phase I Horizontal Measures					
Traffic Circles	No	Daily Entering Volume < 7,500; Speed Limit ≤ 35 mph		No	Grade ≤ 10%
Roundabouts (Single-lane)	Daily Entering Volume < 18,000; Speed Limit ≤ 45 mph		No	Desired design radius of 50+ feet	Grade ≤ 6%; on bike routes, design with clear bike accommodations
Lateral Shifts	No	ADT < 10,000; Speed Limit ≤ 35 mph		OK	Grade ≤ 10%
Chicanes	No	ADT < 5,000; Speed Limit ≤ 35 mph		OK	Grade ≤ 8%
Realigned Intersections	No	Entering Volume < 5,000; Speed Limit ≤ 35 mph		OK	Grade ≤ 8%

Prevailing Concerns

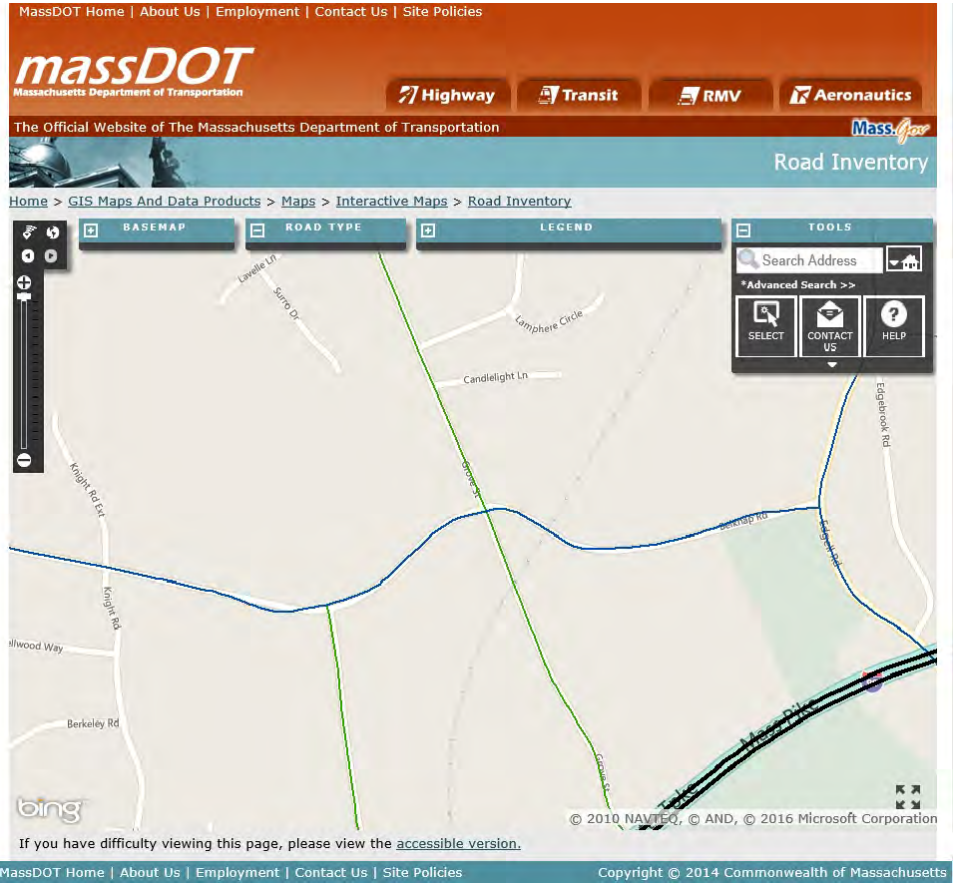
- Excessive vehicle speeds
- Lack of pedestrian and bicycle infrastructure
- Sight distance restrictions
- Distracted drivers

Existing Conditions

- Residential land uses
- Proximity to Brophy Elementary School
- Narrow (20 to 26 feet wide) and winding
- Posted speed limit 25 mph
- No shoulders or sidewalks
- Limited sight distance
- Lack of advance warning signage

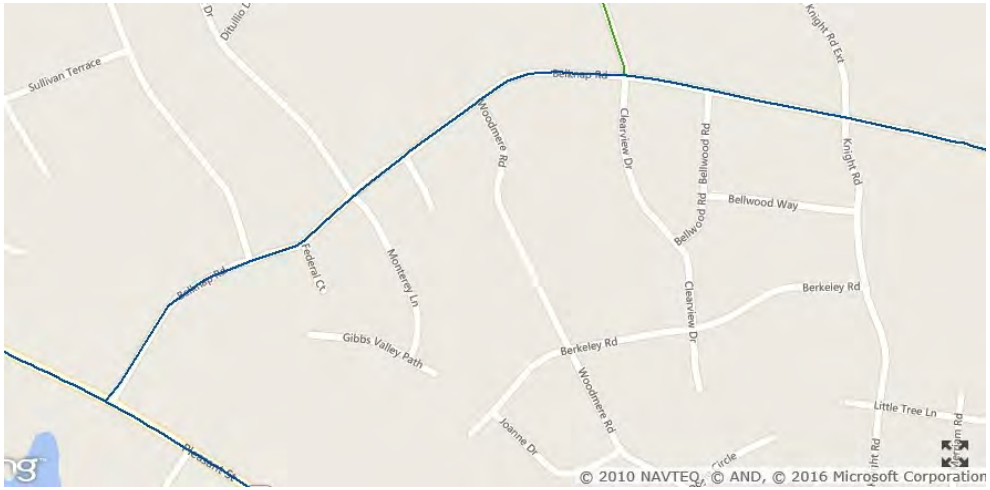
Existing Constraints

- Designated Scenic Roadway
- Limited Right-of-Way
- Urban Minor Arterial
  - Volume control measures
  - Raised speed control devices



Arterial Road

- Deliver traffic from collector roads to freeways and expressways, and between urban centers at the highest level of service possible.
- Provide the highest level of mobility at the greatest vehicular speeds for the longest uninterrupted distances. (MassDOT and FHWA)



Minor Arterials

- Provide high mobility through rural areas, while providing connections between principle arterial and collector roadways in urban areas.
- Speeds vary between 25 MPH in urban areas to 55 MPH in rural areas.
- Support intra-county level shopping, residential development, and travel through urban town centers.
- Serve trips of moderate length at lower levels of service than principal arterials.
- Provide limited land access without penetrating identifiable neighborhoods.

Assessment

- Conducted in March and May 2016
- Volume Counts
- Speed Study
- Sight Line Evaluation
- Signage Review
- Geometric Review (Lane width, shoulder, pedestrian and bicycle accommodations)
- Collision History Assessment

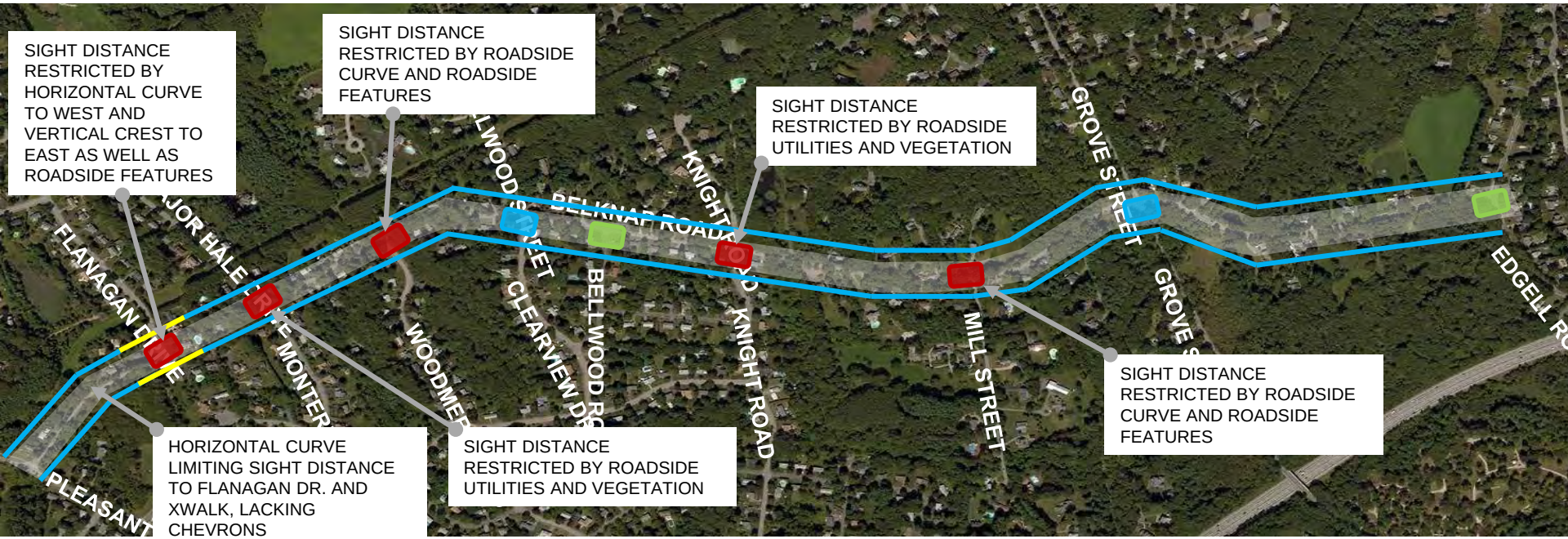
Study Area

25 MPH SPEED LIMIT
20 MPH SCHOOL ZONE SPEED LIMIT (WHEN FLASHING)

ATR = AUTOMATIC TRAFFIC RECORDER
VDP = VEHICLES PER DAY

ALL- WAY STOP

Sight Distance



SIGHT DISTANCE RESTRICTED

SIGHT DISTANCE APPROPRIATE

ALL- WAY STOP

Flanagan Drive

Looking west at Flanagan Drive

Looking east at Flanagan Drive

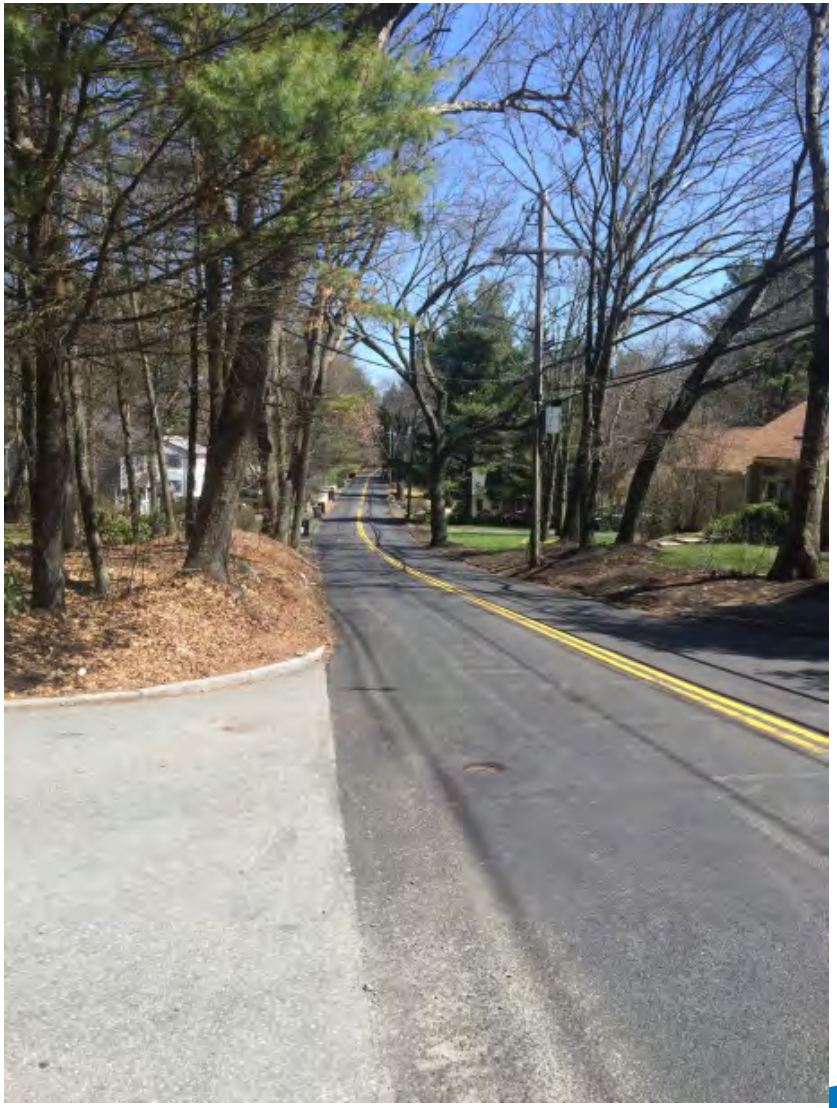
Monterey Lane

Looking west at Monterey Lane

Looking east at Monterey Lane

Major Hale Drive

Looking west at Major Hale Drive



Looking east at Major Hale Drive

Woodmere Road

Looking west at Woodmere Road

Looking east at Woodmere Road

Knight Road (from North)

Looking west at Knight Road

Looking east at Knight Road

Knight Road (from South)

Looking west at Knight Road

Looking east at Knight Road

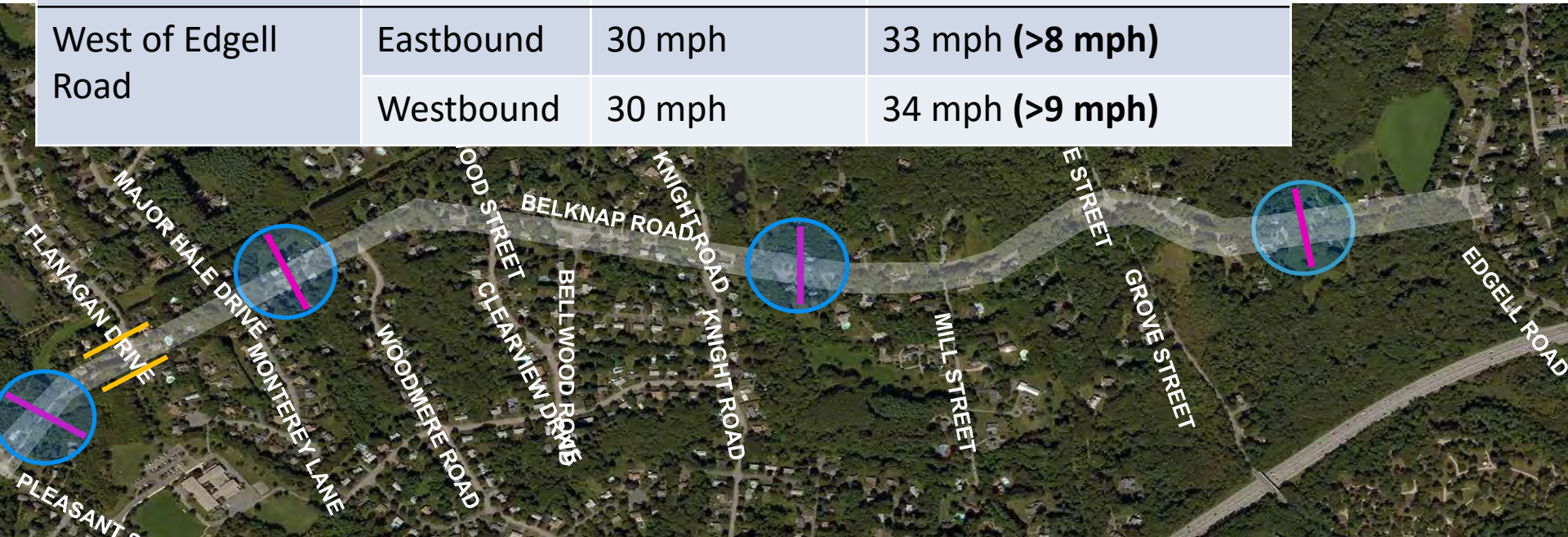
Mill Street

Looking west at Mill Street

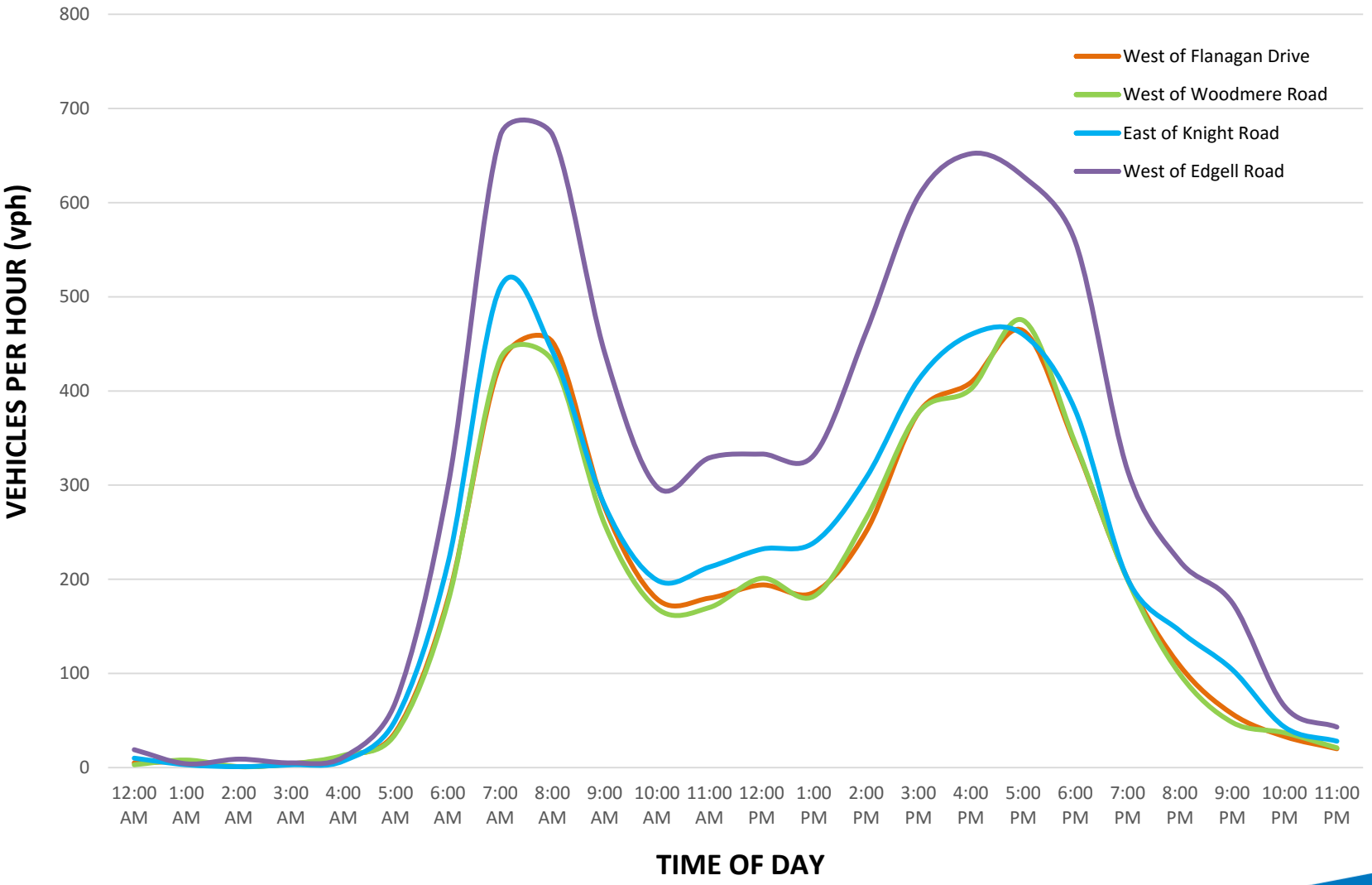
Looking east at Mill Street

Speed Study

Location	Direction	Average Speed	85th Percentile Speed
West of Flanagan Drive	Eastbound	30 mph	33 mph **(>8 to 13 mph)**
	Westbound	32 mph	36 mph **(>11 to 16 mph)**
West of Woodmere Road	Eastbound	30 mph	33 mph **(>8 mph)**
	Westbound	32 mph	36 mph **(>11 mph)**
East of Knight Road	Eastbound	33 mph	38 mph **(>13 mph)**
	Westbound	33 mph	38 mph **(>13 mph)**
West of Edgell Road	Eastbound	30 mph	33 mph **(>8 mph)**
	Westbound	30 mph	34 mph **(>9 mph)**



Average Hourly Volumes - Weekday



Choose FRAMINGHAM

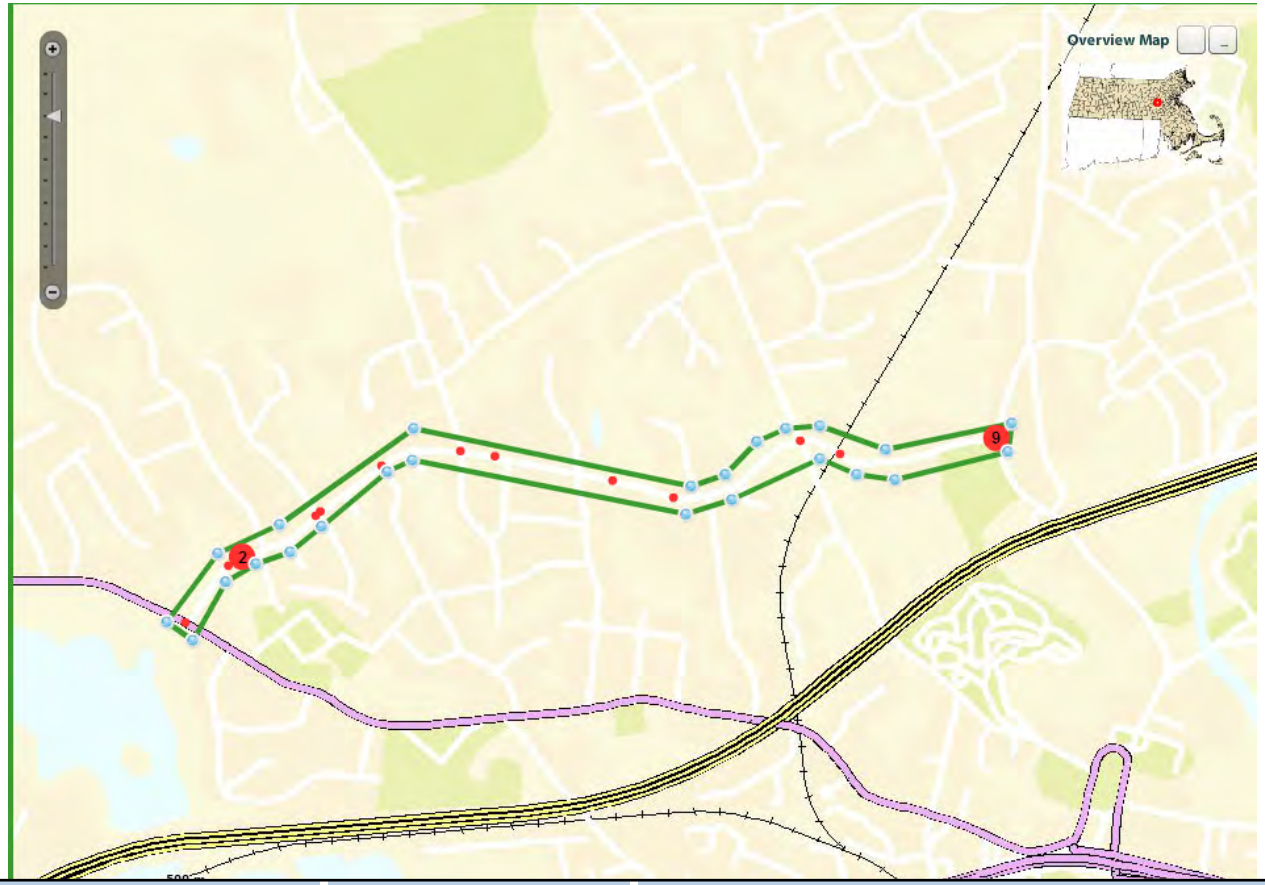
Traffic Volumes Summary

Location	Daily Volume (vpd)	Morning Peak (vph)	Evening Peak (vph)
West of Flanagan Drive	4,400	450	465
West of Woodmere Road	4,360	435	475
East of Knight Road	4,950	510	460
West of Edgell Road	7,220	675	655

Note: Volumes represent bi-directional vehicular traffic

- 55 to 69% of Morning Peak Volumes travel Westbound
- 50 to 65% of Evening Peak Volumes travel Eastbound
- Approximately 2 to 5% of volume is truck traffic

MassDOT Collision Data (2011-2013)



Crash Rate (2.18 c/mvmt) less than statewide average for urban minor arterial (3.65 c/mvmt)

Number of Crashes		Severity			Collision Type						Wet/Icy Conditions	Commuter Peak
Total	Average per Year	PD	PI	F	A	SS	RE	HO	FO	Ped		
22	7.33	12	10	0	4	5	5	2	6	0	14%	48%

Needs Assessment - Conclusions

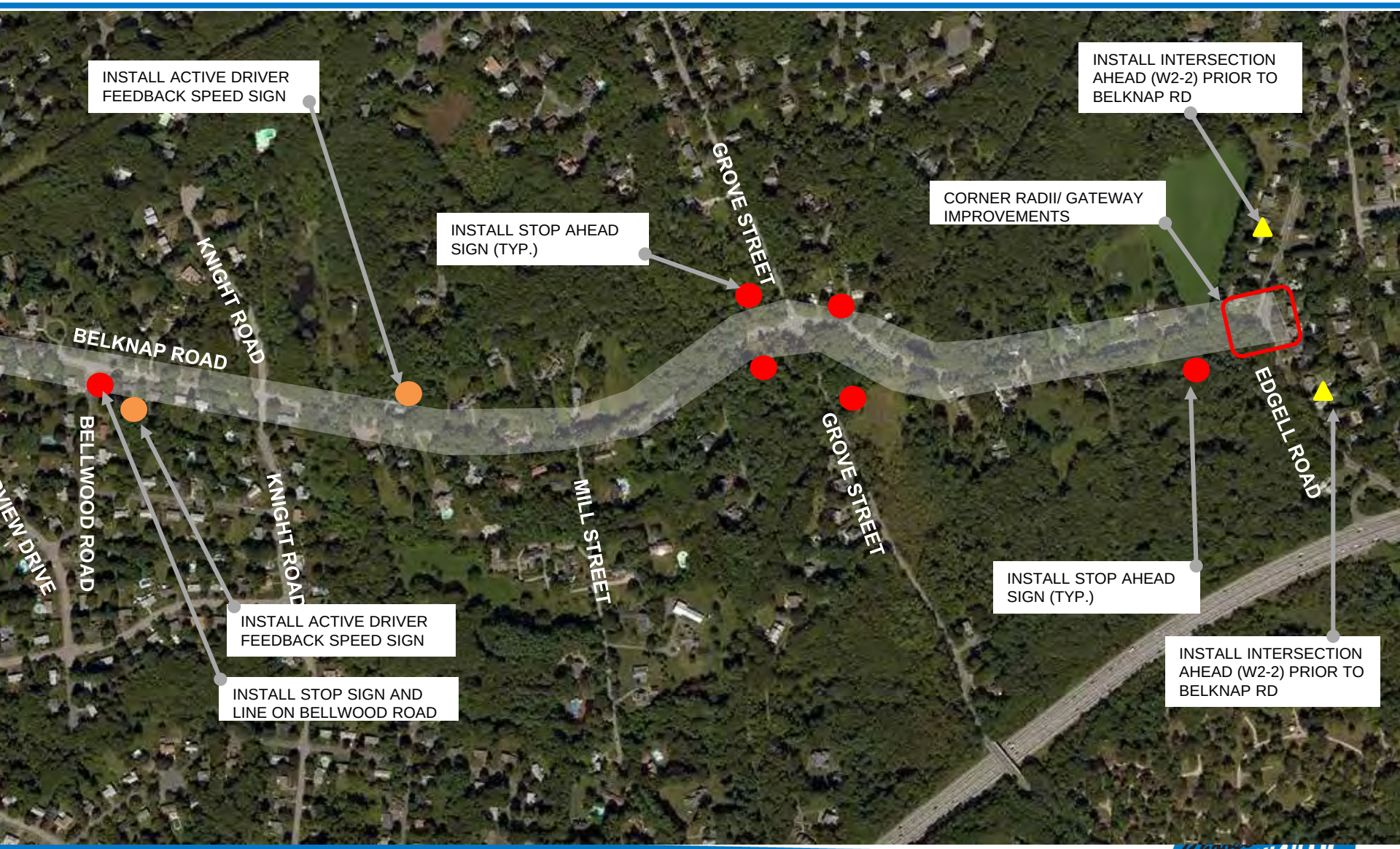
1. Prevailing Safety Deficiencies
   - Elevated Vehicle Speeds
   - Limited Sight Distances / Roadway Curvature
   - Lack of Pedestrian Infrastructure
   - Insufficient Clear Zones
   - Lack of Signage
2. Use of Traffic Calming Measures for Speed Control is *Justified*.
3. Type of Calming Device is Limited by Classification of Roadway.
4. Pedestrian Accommodations Limited by Right-of-Way.
5. Additional Safety Improvements should be Considered.

Traffic Calming Plans

1. White Edge Pavement Markings
2. School Zone Signage and Pavement Markings
3. Share-the-Road Signage & Markings
4. Advance Warning Signs (STOP AHEAD, CURVE AHEAD, Chevrons, Advisory Speeds)
5. Dynamic Speed Feedback Sign

Traffic Calming Plans

Traffic Calming Plans



Questions?

Speed Humps

3 to 3.5 inches in height

12 to 14 feet long

Slow vehicles to 20-23 mph

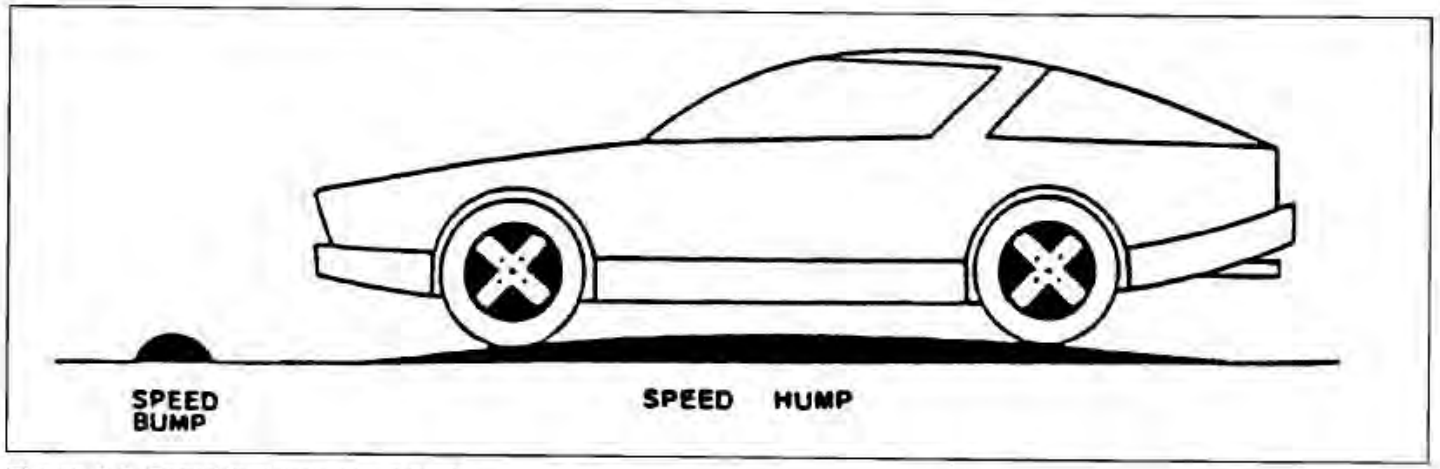


Figure 1.1. Speed hump vs. speed bump.

Source: Clement, J.P. Speed Humps and the Thousand Oaks Experience. *City of Thousand Oaks, Thousand Oaks, California, September 1982.*

Speed Hump Treatments

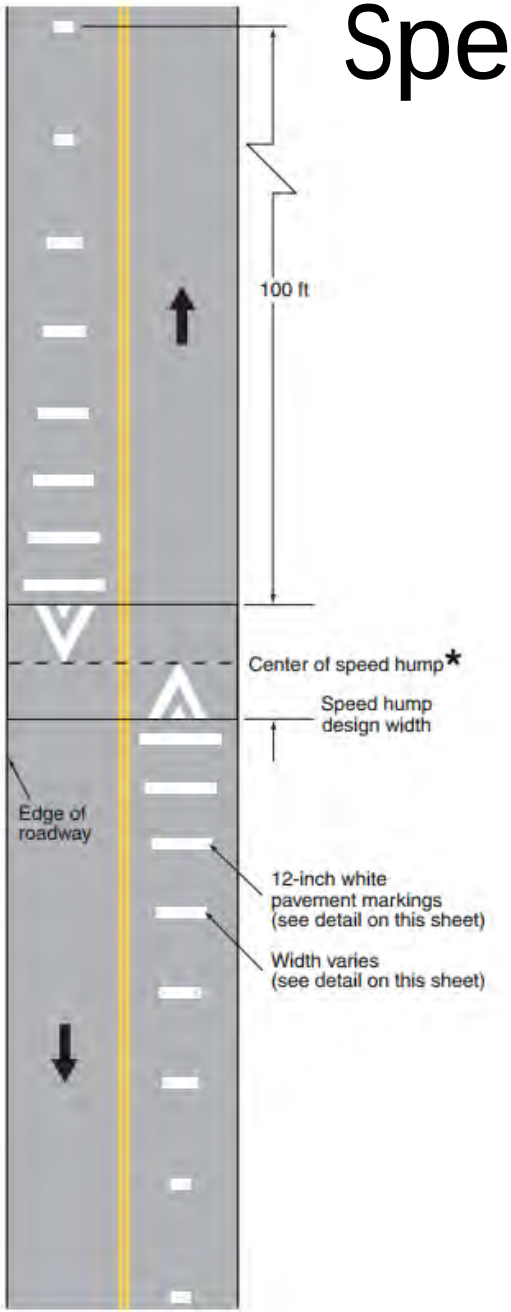
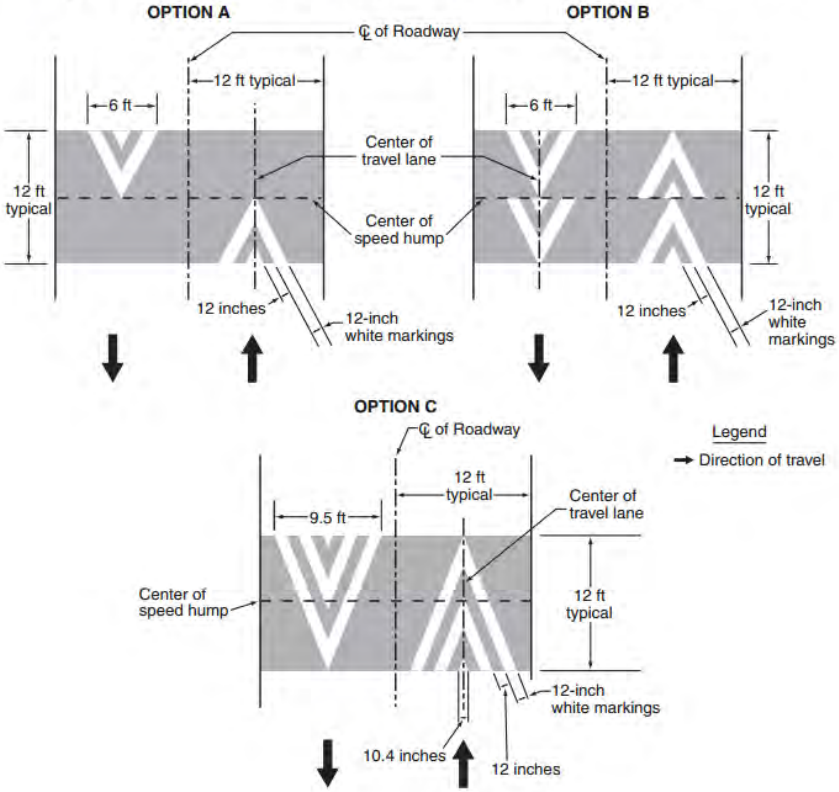
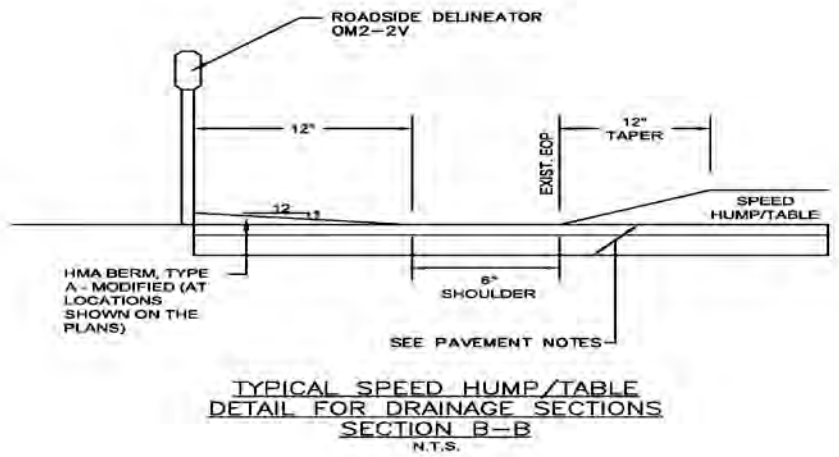


Figure 3B-29. Pavement Markings for Speed Humps without Crosswalks




SPEED
HUMP
NEXT
1/2 MILE
20
M.P.H.

- Speed Hump/Table Design



Vertical Speed Devices

Speed Bumps

Conventional bumps used in previous generations of traffic calming.
Narrow and abrupt, often found on private roadways and parking lots.
These devices are not be considered in anyway as part of this effort.

Vertical Speed Devices

Speed Humps

Raised Area in the Roadway Pavement.

3 to 3.5 inches in height, 12 to 14 feet long.

Slow Vehicles to 20 – 23 mph to traverse.

Choose FRAMINGHAM

Vertical Speed Devices

Speed Lumps/Cushions

Speed Hump with Wheel Base of an Emergency Vehicle Removed so these Vehicles can Proceed Unimpeded

Slow Vehicles to 20 – 23 mph to traverse.

- ***Industry knowledge still forming***

Applicable Traffic Calming Measures
Pavement Markings

Applicable Traffic Calming Measures

Curb Extensions – Neck Downs

Applicable Traffic Calming Measures

Curb Extensions – Mid Block Crossing

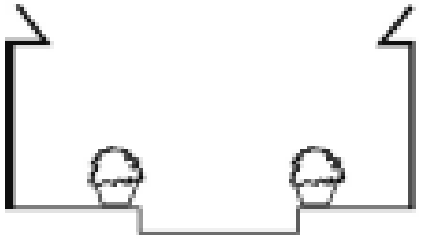
Applicable Traffic Calming Measures
Chicanes

Applicable Traffic Calming Measures

Center Island

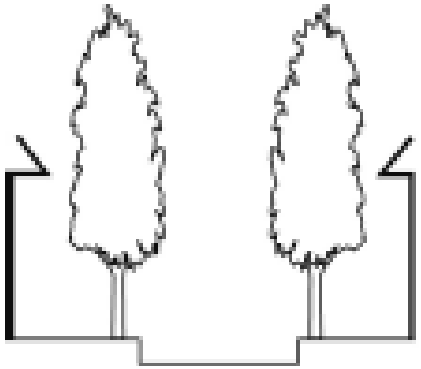
Applicable Traffic Calming Measures
Gateway

Exhibit 16-12
Gateways



Planters

Entrance Features



High Planting

Shelters

Applicable Traffic Calming Measures
Mini Traffic Circle

Applicable Traffic Calming Measures
Speed Hump

Applicable Traffic Calming Measures

Speed Table

Applicable Traffic Calming Measures
Speed Cushions/Lumps

Choose FRAMINGHAM

Applicable Traffic Calming Measures
Raised Intersection

Applicable Traffic Calming Measures

Dynamic Speed Displays